

SEQUENCE LISTING

<110> Jon S. THORSON

<120> MICROMONOSPORA ECHINOSPORA GENES
ENCODING FOR BIOSYNTHESIS OF
CATHICHEAMICIN AND SELF-RESISTANCE THERETO

<130> 2653-40

<140> 09/724,797

<141> 2000-11-28

<150> 60/111,325

<151> 1998-12-07

<160> 95

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 546

<212> DNA

<213> Bacteria

<220>

<221> CDS

<222> (1)...(546)

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Met	Thr	Gln	Glu	Lys	Thr	Ala	Pro	Ala	Ala	Lys	Ser	Thr	Thr	Thr	Lys	
1				5					10						15	

agc	acc	gcc	gcg	aag	aag	ccg	aag	ccc	ccg	aac	tac	gac	ccg	ttc	gtc	96
Ser	Thr	Ala	Ala	Lys	Lys	Pro	Lys	Pro	Pro	Asn	Tyr	Asp	Pro	Phe	Val	
			20					25					30			

cgg	cac	agc	gtc	act	gtc	aag	gcc	gac	cgc	aag	acc	gcc	ttc	aag	acg	144
Arg	His	Ser	Val	Thr	Val	Lys	Ala	Asp	Arg	Lys	Thr	Ala	Phe	Lys	Thr	
			35					40					45			

ttc	ctc	gaa	ggc	ttt	ccg	gag	tgg	tgg	ccg	aac	aac	ttc	cgc	acc	acc	192
Phe	Leu	Glu	Gly	Phe	Pro	Glu	Trp	Trp	Pro	Asn	Asn	Phe	Arg	Thr	Thr	
	50					55					60					

aag	gtc	ggg	gcc	ccg	ctg	ggc	gtc	gac	aag	aag	ggc	ggc	cgc	tgg	tac	240
Lys	Val	Gly	Ala	Pro	Leu	Gly	Val	Asp	Lys	Lys	Gly	Gly	Arg	Trp	Tyr	
	65				70					75					80	

gag	atc	gac	gag	cag	ggc	gag	gag	cac	acc	ttc	ggc	ctg	atc	cgg	aag	288
Glu	Ile	Asp	Glu	Gln	Gly	Glu	Glu	His	Thr	Phe	Gly	Leu	Ile	Arg	Lys	
			85						90					95		

gtg	gac	gag	ccg	gac	acg	ctg	gtc	atc	ggc	tgg	cgg	ctc	aac	ggc	ttc	336
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Val	Asp	Glu	Pro	Asp	Thr	Leu	Val	Ile	Gly	Trp	Arg	Leu	Asn	Gly	Phe		
			100					105					110				
ggc	cgg	atc	gac	ccg	gac	aac	tcg	agc	gag	ttc	acc	gtg	acc	ttc	gtg	384	
Gly	Arg	Ile	Asp	Pro	Asp	Asn	Ser	Ser	Glu	Phe	Thr	Val	Thr	Phe	Val		
		115				120					125						
gcc	gac	ggc	cag	aag	aag	acc	cgg	gtg	gac	gtc	gag	cac	acc	cac	ttc	432	
Ala	Asp	Gly	Gln	Lys	Lys	Thr	Arg	Val	Asp	Val	Glu	His	Thr	His	Phe		
		130				135					140						
gac	cgg	atg	ggc	acc	aag	cac	gcc	aag	cgg	gtc	cgc	aac	ggc	atg	gac	480	
Asp	Arg	Met	Gly	Thr	Lys	His	Ala	Lys	Arg	Val	Arg	Asn	Gly	Met	Asp		
145					150					155				160			
aag	ggc	tgg	ccg	acg	atc	ctc	cag	tcg	ttc	cag	gac	aag	atc	gac	gag	528	
Lys	Gly	Trp	Pro	Thr	Ile	Leu	Gln	Ser	Phe	Gln	Asp	Lys	Ile	Asp	Glu		
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gaa	ggg	gcg	aag	aag	tga											546	
Glu	Gly	Ala	Lys	Lys	*												
			180														

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<400> 2																	
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Ser	Thr	Ala	Ala	Lys	Lys	Pro	Lys	Pro	Pro	Asn	Tyr	Asp	Pro	Phe	Val		
		20						25					30				
Arg	His	Ser	Val	Thr	Val	Lys	Ala	Asp	Arg	Lys	Thr	Ala	Phe	Lys	Thr		
		35				40						45					
Phe	Leu	Glu	Gly	Phe	Pro	Glu	Trp	Trp	Pro	Asn	Asn	Phe	Arg	Thr	Thr		
	50					55				60							
Lys	Val	Gly	Ala	Pro	Leu	Gly	Val	Asp	Lys	Lys	Gly	Gly	Arg	Trp	Tyr		
65					70					75				80			
Glu	Ile	Asp	Glu	Gln	Gly	Glu	Glu	His	Thr	Phe	Gly	Leu	Ile	Arg	Lys		
				85					90					95			
Val	Asp	Glu	Pro	Asp	Thr	Leu	Val	Ile	Gly	Trp	Arg	Leu	Asn	Gly	Phe		
			100					105					110				
Gly	Arg	Ile	Asp	Pro	Asp	Asn	Ser	Ser	Glu	Phe	Thr	Val	Thr	Phe	Val		
		115				120						125					
Ala	Asp	Gly	Gln	Lys	Lys	Thr	Arg	Val	Asp	Val	Glu	His	Thr	His	Phe		
		130				135					140						
Asp	Arg	Met	Gly	Thr	Lys	His	Ala	Lys	Arg	Val	Arg	Asn	Gly	Met	Asp		
145					150					155				160			
Lys	Gly	Trp	Pro	Thr	Ile	Leu	Gln	Ser	Phe	Gln	Asp	Lys	Ile	Asp	Glu		
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Glu	Gly	Ala	Lys	Lys													
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 <222> (1)...(1155)

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atg tct ccg gac gtc agc acc cgc gtc tcc gcc gtc ctg agc agt ggc 96
 Met Ser Pro Asp Val Ser Thr Arg Val Ser Ala Val Leu Ser Ser Gly
 20 25 30

cgg ctg gag cac ggg ccg acc gtc gcc gag tac gag gcg gcc gtg ggc 144
 Arg Leu Glu His Gly Pro Thr Val Ala Glu Tyr Glu Ala Ala Val Gly
 35 40 45

agt cgt atc ggc aac ccc cgg gtg gtc tcg gtc aac tgc ggc acg gcc 192
 Ser Arg Ile Gly Asn Pro Arg Val Val Ser Val Asn Cys Gly Thr Ala
 50 55 60

ggg ctc cac ctg gcg ctg agc ctc gcc gcg cgg ccg ggg gcc ggc gag 240
 Gly Leu His Leu Ala Leu Ser Leu Ala Ala Arg Pro Gly Ala Gly Glu
 65 70 75 80

tcg gag cac gac ggc ccg ggc gag gtg ctc acc acg ccg ctg acc ttc 288
 Ser Glu His Asp Gly Pro Gly Glu Val Leu Thr Thr Pro Leu Thr Phe
 85 90 95

gag ggc acg aac tgg ccg atc ctc gcc aac ggg ctg cgc atc cgg tgg 336
 Glu Gly Thr Asn Trp Pro Ile Leu Ala Asn Gly Leu Arg Ile Arg Trp
 100 105 110

gtg gac gtc gac ccg gcc acc ctc aac atg gac ctc gac gac ctg gcc 384
 Val Asp Val Asp Pro Ala Thr Leu Asn Met Asp Leu Asp Asp Leu Ala
 115 120 125

gcg aag atc tcg ccc gcc acc cgg gcc atc gtg gtg gtc cac tgg ctc 432
 Ala Lys Ile Ser Pro Ala Thr Arg Ala Ile Val Val Val His Trp Leu
 130 135 140

ggc tac ccg gtg gac ctc aac cgg ctg cgc gcc gtc gtg gac cgg gcc 480
 Gly Tyr Pro Val Asp Leu Asn Arg Leu Arg Ala Val Val Asp Arg Ala
 145 150 155 160

acg gcg gga tac gac cgc cgc ccg ctg gtc gtg gag gac tgc gcg cag 528
 Thr Ala Gly Tyr Asp Arg Arg Pro Leu Val Val Glu Asp Cys Ala Gln
 165 170 175

gcg tgg ggc gcc acc tac cgg ggc gcg ccg ctg ggc acg cac ggc aac 576
 Ala Trp Gly Ala Thr Tyr Arg Gly Ala Pro Leu Gly Thr His Gly Asn

180	185	190	
gtc tgc gtg tac agc acc ggc gcg atc aag atc ctg acg acc ggc agc			624
Val Cys Val Tyr Ser Thr Gly Ala Ile Lys Ile Leu Thr Thr Gly Ser			
195	200	205	
ggc ggc ttc gtc gtg ctg ccc gac gac gac ctg tac gac cgg ctc cgg			672
Gly Gly Phe Val Val Leu Pro Asp Asp Asp Leu Tyr Asp Arg Leu Arg			
210	215	220	
ctg cgc cgc tgg ctc ggc atc gag cgg gcg tcg gac cgg atc acc ggc			720
Leu Arg Arg Trp Leu Gly Ile Glu Arg Ala Ser Asp Arg Ile Thr Gly			
225	230	235	240
gac tac gac gtc gcc gag tgg ggc tac cgg ttc atc ctc aac gag atc			768
Asp Tyr Asp Val Ala Glu Trp Gly Tyr Arg Phe Ile Leu Asn Glu Ile			
245	250	255	
ggc ggg gcg atc ggc ctg tcc aac ctg gaa cgc gtc gac gag ctg ctg			816
Gly Gly Ala Ile Gly Leu Ser Asn Leu Glu Arg Val Asp Glu Leu Leu			
260	265	270	
cgc cgg cac cgg gag aac gcc gcg ttc tac gac aag gaa ctg gcc ggc			864
Arg Arg His Arg Glu Asn Ala Ala Phe Tyr Asp Lys Glu Leu Ala Gly			
275	280	285	
atc gac ggc gtc gag cag acc gag cgg gcc gac gac cgg gag ccc gcg			912
Ile Asp Gly Val Glu Gln Thr Glu Arg Ala Asp Asp Arg Glu Pro Ala			
290	295	300	
ttc tgg atg tac ccg ctg aag gtc cgc gac cgt ccc gcc ttc atg cgc			960
Phe Trp Met Tyr Pro Leu Lys Val Arg Asp Arg Pro Ala Phe Met Arg			
305	310	315	320
cgg ctg ctc gac gcc ggc atc gcc acc agc gtc gtg tcg cgc cgc aac			1008
Arg Leu Leu Asp Ala Gly Ile Ala Thr Ser Val Val Ser Arg Arg Asn			
325	330	335	
gac gcg cac agc tgc gtc gcg tcg gcc cgc acc acc ctg ccc ggg ctg			1056
Asp Ala His Ser Cys Val Ala Ser Ala Arg Thr Thr Leu Pro Gly Leu			
340	345	350	
gac cgg gtg gcg gac cgc gtg gtc cac atc ccg gtg ggc tgg tgg ctc			1104
Asp Arg Val Ala Asp Arg Val Val His Ile Pro Val Gly Trp Trp Leu			
355	360	365	
acc gag gac gac cgc tcc cac gtc gtc gaa acg atc aag tcc ggc tgg			1152
Thr Glu Asp Asp Arg Ser His Val Val Glu Thr Ile Lys Ser Gly Trp			
370	375	380	
tga			1155
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<210> 4

<211> 384
 <212> PRT
 <213> Bacteria

<400> 4

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			20					25				30			
Arg	Leu	Glu	His	Gly	Pro	Thr	Val	Ala	Glu	Tyr	Glu	Ala	Ala	Val	Gly
		35				40					45				
Ser	Arg	Ile	Gly	Asn	Pro	Arg	Val	Val	Ser	Val	Asn	Cys	Gly	Thr	Ala
	50					55					60				
Gly	Leu	His	Leu	Ala	Leu	Ser	Leu	Ala	Ala	Arg	Pro	Gly	Ala	Gly	Glu
65					70					75					80
Ser	Glu	His	Asp	Gly	Pro	Gly	Glu	Val	Leu	Thr	Thr	Pro	Leu	Thr	Phe
			85					90						95	
Glu	Gly	Thr	Asn	Trp	Pro	Ile	Leu	Ala	Asn	Gly	Leu	Arg	Ile	Arg	Trp
			100					105					110		
Val	Asp	Val	Asp	Pro	Ala	Thr	Leu	Asn	Met	Asp	Leu	Asp	Asp	Leu	Ala
		115					120					125			
Ala	Lys	Ile	Ser	Pro	Ala	Thr	Arg	Ala	Ile	Val	Val	Val	His	Trp	Leu
	130					135					140				
Gly	Tyr	Pro	Val	Asp	Leu	Asn	Arg	Leu	Arg	Ala	Val	Val	Asp	Arg	Ala
145					150					155					160
Thr	Ala	Gly	Tyr	Asp	Arg	Arg	Pro	Leu	Val	Val	Glu	Asp	Cys	Ala	Gln
				165					170					175	
Ala	Trp	Gly	Ala	Thr	Tyr	Arg	Gly	Ala	Pro	Leu	Gly	Thr	His	Gly	Asn
			180					185					190		
Val	Cys	Val	Tyr	Ser	Thr	Gly	Ala	Ile	Lys	Ile	Leu	Thr	Thr	Gly	Ser
		195				200						205			
Gly	Gly	Phe	Val	Val	Leu	Pro	Asp	Asp	Asp	Leu	Tyr	Asp	Arg	Leu	Arg
	210					215					220				
Leu	Arg	Arg	Trp	Leu	Gly	Ile	Glu	Arg	Ala	Ser	Asp	Arg	Ile	Thr	Gly
225					230					235					240
Asp	Tyr	Asp	Val	Ala	Glu	Trp	Gly	Tyr	Arg	Phe	Ile	Leu	Asn	Glu	Ile
			245						250					255	
Gly	Gly	Ala	Ile	Gly	Leu	Ser	Asn	Leu	Glu	Arg	Val	Asp	Glu	Leu	Leu
			260					265					270		
Arg	Arg	His	Arg	Glu	Asn	Ala	Ala	Phe	Tyr	Asp	Lys	Glu	Leu	Ala	Gly
		275					280					285			
Ile	Asp	Gly	Val	Glu	Gln	Thr	Glu	Arg	Ala	Asp	Asp	Arg	Glu	Pro	Ala
	290					295					300				
Phe	Trp	Met	Tyr	Pro	Leu	Lys	Val	Arg	Asp	Arg	Pro	Ala	Phe	Met	Arg
305					310					315					320
Arg	Leu	Leu	Asp	Ala	Gly	Ile	Ala	Thr	Ser	Val	Val	Ser	Arg	Arg	Asn
			325						330					335	
Asp	Ala	His	Ser	Cys	Val	Ala	Ser	Ala	Arg	Thr	Thr	Leu	Pro	Gly	Leu
		340						345					350		
Asp	Arg	Val	Ala	Asp	Arg	Val	Val	His	Ile	Pro	Val	Gly	Trp	Trp	Leu
	355						360					365			
Thr	Glu	Asp	Asp	Arg	Ser	His	Val	Val	Glu	Thr	Ile	Lys	Ser	Gly	Trp
	370					375						380			

<210> 5

<211> 990
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(990)
 <223> biosynthetic gene

<400> 5

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gtc gtc gaa cgg ctg gtc cgc cgg ggt gac gag gtc gtc gtc tac gac	96
Val Val Glu Arg Leu Val Arg Arg Gly Asp Glu Val Val Val Tyr Asp	
20 25 30	
ctc gcc gac ccg ccg ccc gac ctg gag cac ccg ccg ggc gcg atc cgg	144
Leu Ala Asp Pro Pro Pro Asp Leu Glu His Pro Pro Gly Ala Ile Arg	
35 40 45	
cac gtc cgc ggc gac gtc cgg gac gcc gac ggg ctg gcg gcc gcc gcc	192
His Val Arg Gly Asp Val Arg Asp Ala Asp Gly Leu Ala Ala Ala Ala	
50 55 60	
acc ggc gtg gac gag gtc tac cac ctc gcg gcg gtc gtc ggc gtc gac	240
Thr Gly Val Asp Glu Val Tyr His Leu Ala Ala Val Val Gly Val Asp	
65 70 75 80	
cgg tac ctc agc cgg ccg ctg gac gtg gtc gag atc aac gtg gac ggc	288
Arg Tyr Leu Ser Arg Pro Leu Asp Val Val Glu Ile Asn Val Asp Gly	
85 90 95	
acc cgg aac gcg ttg cgc gcc gca ctg cgc gcc ggt gcc cgg gtc gtg	336
Thr Arg Asn Ala Leu Arg Ala Ala Leu Arg Ala Gly Ala Arg Val Val	
100 105 110	
gtg tcc agc acc agc gag gtg tac ggg cgc aat ccg cgg gtg ccg tgg	384
Val Ser Ser Thr Ser Glu Val Tyr Gly Arg Asn Pro Arg Val Pro Trp	
115 120 125	
cgg gag gac gac gac cgg gtg ctc ggc agc acg gcg acg gac cgg tgg	432
Arg Glu Asp Asp Asp Arg Val Leu Gly Ser Thr Ala Thr Asp Arg Trp	
130 135 140	
tcg tac tcg acg agc aag gcg gcg gcc gag cac ctg gcc ttc gcc ttc	480
Ser Tyr Ser Thr Ser Lys Ala Ala Ala Glu His Leu Ala Phe Ala Phe	
145 150 155 160	
cac cgg cag gag ggc ctg ccg gtg acg gtg ctg cgg tac ttc aac gtc	528
His Arg Gln Glu Gly Leu Pro Val Thr Val Leu Arg Tyr Phe Asn Val	
165 170 175	
tac ggc cca cgc cag cgc ccg gcg tac gtc ctc agc cgc acc gtc gcc	576
Tyr Gly Pro Arg Gln Arg Pro Ala Tyr Val Leu Ser Arg Thr Val Ala	

180	185	190	
cgc ctg ctg cgg ggc gtt ccg ccc gtg gtg tac gac gac ggc cgc cag			624
Arg Leu Leu Arg Gly Val Pro Pro Val Val Tyr Asp Asp Gly Arg Gln			
195	200	205	
acg cgg tgc ttc acc tgg atc gac gag gcg gcc gag gcg acc ctg ctg			672
Thr Arg Cys Phe Thr Trp Ile Asp Glu Ala Ala Glu Ala Thr Leu Leu			
210	215	220	
gcc gcc gcc cac ccg cgg gcc gtc ggc gag tgt ttc aac atc ggc agc			720
Ala Ala Ala His Pro Arg Ala Val Gly Glu Cys Phe Asn Ile Gly Ser			
225	230	235	240
agc gtg gag acc acc gtc gcc gag gcg gtc ccg ctg gcc ggc acg gtg			768
Ser Val Glu Thr Thr Val Ala Glu Ala Val Arg Leu Ala Gly Thr Val			
245	250	255	
gcc ggg gtg ccg gtg gcg gcc cag acc gcg gac acc gga gcc ggg ctc			816
Ala Gly Val Pro Val Ala Ala Gln Thr Ala Asp Thr Gly Ala Gly Leu			
260	265	270	
ggc gcc cgc tac cag gac att ccc cgc cgc gta ccg gac tgc ggc aag			864
Gly Ala Arg Tyr Gln Asp Ile Pro Arg Arg Val Pro Asp Cys Gly Lys			
275	280	285	
gcc gcc gcg ctg ctg gac tgg cgg gcc cgg gtg ccg ctg gtg acc ggc			912
Ala Ala Ala Leu Leu Asp Trp Arg Ala Arg Val Pro Leu Val Thr Gly			
290	295	300	
ctg cgc cgg acc gtc gag tgg gcc cgc cgc aac ccg tgg tgg acc gcc			960
Leu Arg Arg Thr Val Glu Trp Ala Arg Arg Asn Pro Trp Trp Thr Ala			
305	310	315	320
cag gcc gac gac gga ctg gtc gtc agg tag			990
Gln Ala Asp Asp Gly Leu Val Val Arg *			
325			

<210> 6
 <211> 329
 <212> PRT
 <213> Bacteria

<400> 6
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 20 25 30
 Leu Ala Asp Pro Pro Pro Asp Leu Glu His Pro Pro Gly Ala Ile Arg
 35 40 45
 His Val Arg Gly Asp Val Arg Asp Ala Asp Gly Leu Ala Ala Ala Ala
 50 55 60
 Thr Gly Val Asp Glu Val Tyr His Leu Ala Ala Val Val Gly Val Asp
 65 70 75 80
 Arg Tyr Leu Ser Arg Pro Leu Asp Val Val Glu Ile Asn Val Asp Gly

Thr	Ala	Ile	Lys	Met	Leu	Ala	Thr	Leu	Met	Arg	Pro	Thr	Ser	Gly	Thr		
50						55					60						
gcg	tcc	gtg	ctg	ggg	cac	gac	gtg	gtc	cgc	gag	gcc	gcc	gag	gtc	cgg	240	
Ala	Ser	Val	Leu	Gly	His	Asp	Val	Val	Arg	Glu	Ala	Ala	Glu	Val	Arg		
65					70				75						80		
cgc	cgc	atc	ggc	ctc	acc	ggc	cag	acc	atg	tcc	gtc	gac	gag	gac	atg	288	
Arg	Arg	Ile	Gly	Leu	Thr	Gly	Gln	Thr	Met	Ser	Val	Asp	Glu	Asp	Met		
				85					90						95		
acc	ggc	gtg	cag	aac	ctg	atc	ctc	gcc	ggc	cgc	ctg	cag	ggc	ctg	cgg	336	
Thr	Gly	Val	Gln	Asn	Leu	Ile	Leu	Ala	Gly	Arg	Leu	Gln	Gly	Leu	Arg		
			100					105					110				
cac	gcg	tcc	gcg	gcc	gcg	cgg	gcg	gag	cag	ttg	atg	gag	gcg	ttc	gac	384	
His	Ala	Ser	Ala	Ala	Ala	Arg	Ala	Glu	Gln	Leu	Met	Glu	Ala	Phe	Asp		
		115					120					125					
ctc	acc	gag	gtc	ggc	ggc	cgg	ctg	gtg	aag	acc	ttc	tcc	ggc	ggg	cag	432	
Leu	Thr	Glu	Val	Gly	Gly	Arg	Leu	Val	Lys	Thr	Phe	Ser	Gly	Gly	Gln		
		130				135					140						
cgg	cgg	cgc	atc	gac	gtg	gcc	gcg	agc	atg	gtg	gtc	acc	ccc	gag	ctg	480	
Arg	Arg	Arg	Ile	Asp	Val	Ala	Ala	Ser	Met	Val	Val	Thr	Pro	Glu	Leu		
145					150				155						160		
ctg	ttc	ctc	gac	gag	cgc	acc	acc	ggc	ctc	gac	ccg	cgc	agc	cgc	agc	528	
Leu	Phe	Leu	Asp	Glu	Pro	Thr	Thr	Gly	Leu	Asp	Pro	Arg	Ser	Arg	Ser		
			165					170						175			
gag	gtc	tgg	gag	atg	atc	cgg	gcg	ctg	gtc	cgg	gac	ggg	ggc	acc	gtc	576	
Glu	Val	Trp	Glu	Met	Ile	Arg	Ala	Leu	Val	Arg	Asp	Gly	Gly	Thr	Val		
			180					185					190				
ctg	ctg	acc	acg	cag	tac	ctc	gac	gag	gcg	gac	cac	ctc	gcc	gac	gag	624	
Leu	Leu	Thr	Thr	Gln	Tyr	Leu	Asp	Glu	Ala	Asp	His	Leu	Ala	Asp	Glu		
		195					200					205					
ctg	acg	ctc	atc	gac	cac	ggc	cgc	atc	gtg	gcg	cag	ggc	acc	ccg	ccg	672	
Leu	Thr	Leu	Ile	Asp	His	Gly	Arg	Ile	Val	Ala	Gln	Gly	Thr	Pro	Pro		
	210					215					220						
gag	ctg	aag	gcg	agc	cgc	gcc	gcc	ggc	gtg	ctc	gac	gtg	cgg	ctg	cgt	720	
Glu	Leu	Lys	Ala	Ser	Arg	Ala	Ala	Gly	Val	Leu	Asp	Val	Arg	Leu	Arg		
225					230				235						240		
gac	ccc	gag	cgc	cgg	gcc	gac	gcg	ggc	gcc	ctg	ctc	gcc	aag	gcc	gtc	768	
Asp	Pro	Glu	Arg	Arg	Ala	Asp	Ala	Gly	Ala	Leu	Leu	Ala	Lys	Ala	Val		
				245				250						255			
ggc	gcc	gcc	gcc	gac	ctc	gac	tcc	gat	ccg	gcg	cgg	ctg	tgc	gtg	cgg	816	
Gly	Ala	Ala	Ala	Asp	Leu	Asp	Ser	Asp	Pro	Ala	Arg	Leu	Ser	Val	Arg		
			260					265					270				
gtg	acc	gac	ccc	gac	cgg	gcg	gcg	ctg	gcc	ctg	ggc	gag	ctg	gcg	cgg	864	

Val	Thr	Asp	Pro	Asp	Arg	Ala	Ala	Leu	Ala	Leu	Gly	Glu	Leu	Ala	Arg		
		275					280					285					
gcc	ggc	atc	cac	gtc	gac	gac	ttc	acg	ctc	ggc	cag	ccc	tcg	ctc	gac	912	
Ala	Gly	Ile	His	Val	Asp	Asp	Phe	Thr	Leu	Gly	Gln	Pro	Ser	Leu	Asp		
	290					295				300							
acg	gtg	ttc	ctc	gcc	ctc	acc	ggg	cac	tcg	acg	gtc	gac	gcc	agc	gaa	960	
Thr	Val	Phe	Leu	Ala	Leu	Thr	Gly	His	Ser	Thr	Val	Asp	Ala	Ser	Glu		
305					310					315					320		
gaa	gag	gaa	gca	gag	gta	cgg	gca	tga								987	
Glu	Glu	Glu	Ala	Glu	Val	Arg	Ala	*									
				325													

<210> 8
 <211> 328
 <212> PRT
 <213> Bacteria

<400> 8

Met	Thr	Thr	Asn	Pro	Ala	Leu	Ala	Ile	Glu	Thr	Arg	Asp	Leu	Val	Lys		
1				5					10					15			
Val	Phe	Gly	Gln	Thr	Arg	Ala	Val	Asp	Gly	Leu	Asp	Leu	Val	Val	Arg		
			20					25					30				
Ala	Gly	Thr	Ile	His	Gly	Val	Leu	Gly	Pro	Asn	Gly	Ala	Gly	Lys	Thr		
		35					40					45					
Thr	Ala	Ile	Lys	Met	Leu	Ala	Thr	Leu	Met	Arg	Pro	Thr	Ser	Gly	Thr		
	50					55				60							
Ala	Ser	Val	Leu	Gly	His	Asp	Val	Val	Arg	Glu	Ala	Ala	Glu	Val	Arg		
65					70					75					80		
Arg	Arg	Ile	Gly	Leu	Thr	Gly	Gln	Thr	Met	Ser	Val	Asp	Glu	Asp	Met		
			85						90					95			
Thr	Gly	Val	Gln	Asn	Leu	Ile	Leu	Ala	Gly	Arg	Leu	Gln	Gly	Leu	Arg		
			100					105					110				
His	Ala	Ser	Ala	Ala	Ala	Arg	Ala	Glu	Gln	Leu	Met	Glu	Ala	Phe	Asp		
		115					120					125					
Leu	Thr	Glu	Val	Gly	Gly	Arg	Leu	Val	Lys	Thr	Phe	Ser	Gly	Gly	Gln		
	130					135					140						
Arg	Arg	Arg	Ile	Asp	Val	Ala	Ala	Ser	Met	Val	Val	Thr	Pro	Glu	Leu		
145					150					155					160		
Leu	Phe	Leu	Asp	Glu	Pro	Thr	Thr	Gly	Leu	Asp	Pro	Arg	Ser	Arg	Ser		
				165					170					175			
Glu	Val	Trp	Glu	Met	Ile	Arg	Ala	Leu	Val	Arg	Asp	Gly	Gly	Thr	Val		
		180						185					190				
Leu	Leu	Thr	Thr	Gln	Tyr	Leu	Asp	Glu	Ala	Asp	His	Leu	Ala	Asp	Glu		
	195						200					205					
Leu	Thr	Leu	Ile	Asp	His	Gly	Arg	Ile	Val	Ala	Gln	Gly	Thr	Pro	Pro		
	210					215					220						
Glu	Leu	Lys	Ala	Ser	Arg	Ala	Ala	Gly	Val	Leu	Asp	Val	Arg	Leu	Arg		
225					230					235					240		
Asp	Pro	Glu	Arg	Arg	Ala	Asp	Ala	Gly	Ala	Leu	Leu	Ala	Lys	Ala	Val		
				245					250					255			
Gly	Ala	Ala	Ala	Asp	Leu	Asp	Ser	Asp	Pro	Ala	Arg	Leu	Ser	Val	Arg		
			260					265						270			

Val Thr Asp Pro Asp Arg Ala Ala Leu Ala Leu Gly Glu Leu Ala Arg
 275 280 285
 Ala Gly Ile His Val Asp Asp Phe Thr Leu Gly Gln Pro Ser Leu Asp
 290 295 300
 Thr Val Phe Leu Ala Leu Thr Gly His Ser Thr Val Asp Ala Ser Glu
 305 310 315 320
 Glu Glu Glu Ala Glu Val Arg Ala
 325

<210> 9
 <211> 1686
 <212> DNA
 <213> Bacteria

<220>
 <221> misc_feature
 <222> (1)...(1686)
 <223> n = A,T,C or G

<221> misc_feature
 <222> (1)...(1686)
 <223> n = A,T,C or G

<221> CDS
 <222> (1)...(1686)

<400> 9
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 Met Thr Thr Pro Ser Thr Glu Val Arg Pro Leu Pro Ala Glu Ile Phe
 1 5 10 15
 agc cga tcg gtg gcc ggc gcg gaa cgg ccg cca cgc ccc ggc ccg ctg 96
 Ser Arg Ser Val Ala Gly Ala Glu Arg Pro Pro Arg Pro Gly Pro Leu
 20 25 30
 ttc gcc gtc cgc acc ttc gcc tgg cgg aac ctg atc aag ctc cgg tac 144
 Phe Ala Val Arg Thr Phe Ala Trp Arg Asn Leu Ile Lys Leu Arg Tyr
 35 40 45
 gtg cag gac cac ctg ggc acc gcg gtg gtc ttc ccg atc atc ctg acg 192
 Val Gln Asp His Leu Gly Thr Ala Val Val Phe Pro Ile Ile Leu Thr
 50 55 60
 ctg gtc ttc acc tat ctg ctc ggc ggc gcg atc gcc ggc tcg ccc cgg 240
 Leu Val Phe Thr Tyr Leu Leu Gly Gly Ala Ile Ala Gly Ser Pro Arg
 65 70 75 80
 gag tac ctg cag ttc ttc ctt ccc ggc gtg atc gtc ctc tcg ctc gtg 288
 Glu Tyr Leu Gln Phe Phe Leu Pro Gly Val Ile Val Leu Ser Leu Val
 85 90 95
 tcg tcg agc atg atg agc gcc ctg acg ctg aac cgg gac atc gcc acc 336
 Ser Ser Ser Met Met Ser Ala Leu Thr Leu Asn Arg Asp Ile Ala Thr
 100 105 110

ggc atg ttc gac cgg gtc cgc agc acg ccc atc tgg cag ccc gcg gta	384
Gly Met Phe Asp Arg Val Arg Ser Thr Pro Ile Trp Gln Pro Ala Val	
115 120 125	
ctg gtc ggg gcg atg gcc ggc gac gcc gtc cgg tac gcc ctg acc tcg	432
Leu Val Gly Ala Met Ala Gly Asp Ala Val Arg Tyr Ala Leu Thr Ser	
130 135 140	
atc gtg ccg ctg tcg ctc ggc ctg ctg ctc ggc ttc cgg ccg gac ggc	480
Ile Val Pro Leu Ser Leu Gly Leu Leu Leu Gly Phe Arg Pro Asp Gly	
145 150 155 160	
ggc ctg tcc ggg gtg gtg ctc gcc ctg ctc tac ctg cag ctg ttc acc	528
Gly Leu Ser Gly Val Val Leu Ala Leu Leu Tyr Leu Gln Leu Phe Thr	
165 170 175	
ttc agc gtc gcc tgg ctg tgg atg ctg ttc gcg gtg ctg atc ccg cag	576
Phe Ser Val Ala Trp Leu Trp Met Leu Phe Ala Val Leu Ile Pro Gln	
180 185 190	
ccg acc gcc gcc gcc ggc gtg gtg aac ctc ctg cag ttc gtg ctc ctc	624
Pro Thr Ala Ala Ala Gly Val Val Asn Leu Leu Gln Phe Val Leu Leu	
195 200 205	
ttc ggc agc aac atc ctg gcg ccg tcg cag acg atg ccg ggc tgg ctg	672
Phe Gly Ser Asn Ile Leu Ala Pro Ser Gln Thr Met Pro Gly Trp Leu	
210 215 220	
gag gcg gtg gtc aag ttg aac ccc gtc acc cac gcc gcg acc gcc acc	720
Glu Ala Val Val Lys Leu Asn Pro Val Thr His Ala Ala Thr Ala Thr	
225 230 235 240	
cgc ggg ctg ntg cac ggc acg gtg acc tcg ggg gag atg ggc gcn ggc	768
Arg Gly Leu Xaa His Gly Thr Val Thr Ser Gly Glu Met Gly Ala Gly	
245 250 255	
ctg ctg acc tgc gcc gtg ctc atc gtg gct gct cgc ccc gcc cac gat	816
Leu Leu Thr Cys Ala Val Leu Ile Val Ala Ala Arg Pro Ala His Asp	
260 265 270	
ctg gct cta cag ccg caa gca gcg ctg aca ccc ctc ccc gac ggc ccc	864
Leu Ala Leu Gln Pro Gln Ala Ala Leu Thr Pro Leu Pro Asp Gly Pro	
275 280 285	
ggt gtg ccc cct gtt ctc ctc gca ggg gca ggc ccg ggg ccg tcg cgg	912
Gly Val Pro Pro Val Leu Leu Ala Gly Ala Gly Pro Gly Pro Ser Arg	
290 295 300	
cat ccc gcc gcc ggt cgg cgc tgt gcc ccg gcc gca ccc gga gcc ttt	960
His Pro Ala Ala Gly Arg Arg Cys Ala Pro Ala Ala Pro Gly Ala Phe	
305 310 315 320	
gcc gcg ccg gcc acc gct gct gcg gcc gta acc gcc cgc tgt gtc ggt	1008
Ala Ala Pro Ala Thr Ala Ala Ala Val Thr Ala Arg Cys Val Gly	
325 330 335	

cac cgg cgc cgt ggc ggc gca ccg tgt cgg ggc cgg ctg ccc act tgt	1056
His Arg Arg Arg Gly Gly Ala Pro Cys Arg Gly Arg Leu Pro Thr Cys	
340 345 350	
ggc cgc cgt gcg gtc ggc gga cgg acg gcg gcc ccg gac gga cat gag	1104
Gly Arg Arg Ala Val Gly Gly Arg Thr Ala Ala Pro Asp Gly His Glu	
355 360 365	
tcc gtc cgg ggc cgc gtc gtg gtc ggt cga gca gct ccc gac cgg cta	1152
Ser Val Arg Gly Arg Val Val Val Gly Arg Ala Ala Pro Asp Arg Leu	
370 375 380	
cga gcc gga gtg gac cag cgc ggc cca ggc ctc gcc gcg ctc ctg cga	1200
Arg Ala Gly Val Asp Gln Arg Gly Pro Gly Leu Ala Ala Leu Leu Arg	
385 390 395 400	
gat ccg cat cat ctc ggg gct cgg ctc gaa ctc ctc ggc cgc gtc ctc	1248
Asp Pro His His Leu Gly Ala Arg Leu Glu Leu Leu Gly Arg Val Leu	
405 410 415	
cgg gac cgg gcc gcc cgg cag gtc gcc ccg gat gaa cat acc gag gaa	1296
Arg Asp Arg Ala Ala Arg Gln Val Ala Pro Asp Glu His Thr Glu Glu	
420 425 430	
gtc gag cgc cat ctc cca gcc gac gcc gac ctc cac gag cat ctg ctc	1344
Val Glu Arg His Leu Pro Ala Asp Ala Asp Leu His Glu His Leu Leu	
435 440 445	
cga ggt cgt ggc gtg ctc cag ctc cag cag ggt gcc gtc gcc ctc ctc	1392
Arg Gly Arg Gly Val Leu Gln Leu Gln Gln Gly Ala Val Ala Leu Leu	
450 455 460	
gtc agc cgc agc tcc acc tcg ctg tcc ggc ttg ccc tcg tac acc cag	1440
Val Ser Arg Ser Ser Thr Ser Leu Ser Gly Leu Pro Ser Tyr Thr Gln	
465 470 475 480	
ctg atg gtg agc cgg cgc ggt ggc tcg cag cgc agg atg tcg ccg ctg	1488
Leu Met Val Ser Arg Arg Gly Gly Ser Gln Arg Arg Met Ser Pro Leu	
485 490 495	
gcg ttg ccc tgc agg gcg aag ttg cca ccc tcg cgg agg tcg ccc ttg	1536
Ala Leu Pro Cys Arg Ala Lys Leu Pro Pro Ser Arg Arg Ser Pro Leu	
500 505 510	
ggc tcg atg aac cag cgg ttg atg cgg ttc ggg tcg gtg cag gcg ctc	1584
Gly Ser Met Asn Gln Arg Leu Met Arg Phe Gly Ser Val Gln Ala Leu	
515 520 525	
cag acc tcg tcg acg ggc gcg tcg tac cgt tgc cgg atg atg atg ctg	1632
Gln Thr Ser Ser Thr Gly Ala Ser Tyr Arg Cys Arg Met Met Met Leu	
530 535 540	
cgg gcc tcg ccg gcc ggg atg gtg cgc cgg ccg agg gca cgc tcc gtc	1680
Arg Ala Ser Pro Ala Gly Met Val Arg Arg Pro Arg Ala Arg Ser Val	
545 550 555 560	

gcc tga
Ala *

1686

<210> 10
<211> 561
<212> PRT
<213> Bacteria

<220>
<221> VARIANT
<222> (1)...(561)
<223> Xaa = Any Amino Acid

<221> VARIANT
<222> (1)...(561)
<223> Xaa = Any Amino Acid

<400> 10
Met Thr Thr Pro Ser Thr Glu Val Arg Pro Leu Pro Ala Glu Ile Phe
1 5 10 15
Ser Arg Ser Val Ala Gly Ala Glu Arg Pro Pro Arg Pro Gly Pro Leu
20 25 30
Phe Ala Val Arg Thr Phe Ala Trp Arg Asn Leu Ile Lys Leu Arg Tyr
35 40 45
Val Gln Asp His Leu Gly Thr Ala Val Val Phe Pro Ile Ile Leu Thr
50 55 60
Leu Val Phe Thr Tyr Leu Leu Gly Gly Ala Ile Ala Gly Ser Pro Arg
65 70 75 80
Glu Tyr Leu Gln Phe Phe Leu Pro Gly Val Ile Val Leu Ser Leu Val
85 90 95
Ser Ser Ser Met Met Ser Ala Leu Thr Leu Asn Arg Asp Ile Ala Thr
100 105 110
Gly Met Phe Asp Arg Val Arg Ser Thr Pro Ile Trp Gln Pro Ala Val
115 120 125
Leu Val Gly Ala Met Ala Gly Asp Ala Val Arg Tyr Ala Leu Thr Ser
130 135 140
Ile Val Pro Leu Ser Leu Gly Leu Leu Leu Gly Phe Arg Pro Asp Gly
145 150 155 160
Gly Leu Ser Gly Val Val Leu Ala Leu Leu Tyr Leu Gln Leu Phe Thr
165 170 175
Phe Ser Val Ala Trp Leu Trp Met Leu Phe Ala Val Leu Ile Pro Gln
180 185 190
Pro Thr Ala Ala Ala Gly Val Val Asn Leu Leu Gln Phe Val Leu Leu
195 200 205
Phe Gly Ser Asn Ile Leu Ala Pro Ser Gln Thr Met Pro Gly Trp Leu
210 215 220
Glu Ala Val Val Lys Leu Asn Pro Val Thr His Ala Ala Thr Ala Thr
225 230 235 240
Arg Gly Leu Xaa His Gly Thr Val Thr Ser Gly Glu Met Gly Ala Gly
245 250 255
Leu Leu Thr Cys Ala Val Leu Ile Val Ala Ala Arg Pro Ala His Asp
260 265 270
Leu Ala Leu Gln Pro Gln Ala Ala Leu Thr Pro Leu Pro Asp Gly Pro
275 280 285

Gly Val Pro Pro Val Leu Leu Ala Gly Ala Gly Pro Gly Pro Ser Arg
 290 295 300
 His Pro Ala Ala Gly Arg Arg Cys Ala Pro Ala Ala Pro Gly Ala Phe
 305 310 315 320
 Ala Ala Pro Ala Thr Ala Ala Ala Ala Val Thr Ala Arg Cys Val Gly
 325 330 335
 His Arg Arg Arg Gly Gly Ala Pro Cys Arg Gly Arg Leu Pro Thr Cys
 340 345 350
 Gly Arg Arg Ala Val Gly Gly Arg Thr Ala Ala Pro Asp Gly His Glu
 355 360 365
 Ser Val Arg Gly Arg Val Val Val Gly Arg Ala Ala Pro Asp Arg Leu
 370 375 380
 Arg Ala Gly Val Asp Gln Arg Gly Pro Gly Leu Ala Ala Leu Leu Arg
 385 390 395 400
 Asp Pro His His Leu Gly Ala Arg Leu Glu Leu Leu Gly Arg Val Leu
 405 410 415
 Arg Asp Arg Ala Ala Arg Gln Val Ala Pro Asp Glu His Thr Glu Glu
 420 425 430
 Val Glu Arg His Leu Pro Ala Asp Ala Asp Leu His Glu His Leu Leu
 435 440 445
 Arg Gly Arg Gly Val Leu Gln Leu Gln Gln Gly Ala Val Ala Leu Leu
 450 455 460
 Val Ser Arg Ser Ser Thr Ser Leu Ser Gly Leu Pro Ser Tyr Thr Gln
 465 470 475 480
 Leu Met Val Ser Arg Arg Gly Gly Ser Gln Arg Arg Met Ser Pro Leu
 485 490 495
 Ala Leu Pro Cys Arg Ala Lys Leu Pro Pro Ser Arg Arg Ser Pro Leu
 500 505 510
 Gly Ser Met Asn Gln Arg Leu Met Arg Phe Gly Ser Val Gln Ala Leu
 515 520 525
 Gln Thr Ser Ser Thr Gly Ala Ser Tyr Arg Cys Arg Met Met Met Leu
 530 535 540
 Arg Ala Ser Pro Ala Gly Met Val Arg Arg Pro Arg Ala Arg Ser Val
 545 550 555 560
 Ala

<210> 11
 <211> 792
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(792)

<400> 11
 atg cga tgg agg ctg cgg atg gac agc ggc gac ggt cag gac ctg cgt 48
 Met Arg Trp Arg Leu Arg Met Asp Ser Gly Asp Gly Gln Asp Leu Arg
 1 5 10 15
 gcg ttc gtg cac gac tca ccg gag gag acg gag acc acc cag cgc ctg 96
 Ala Phe Val His Asp Ser Pro Glu Glu Thr Glu Thr Thr Gln Arg Leu
 20 25 30

acg aag ctc ttg acc aac tct ccg atc ccc acg gag gaa ctg gtc aac	144
Thr Lys Leu Leu Thr Asn Ser Pro Ile Pro Thr Glu Glu Leu Val Asn	
35 40 45	
aac ctc ccc ctg ttc ctg cgc cgc cac cag atg acc gat ctg ctc tcg	192
Asn Leu Pro Leu Phe Leu Arg Arg His Gln Met Thr Asp Leu Leu Ser	
50 55 60	
atg gac gcg ctc tac cgt cag gtc ctc gac gtg ccg ggc gtg atc atg	240
Met Asp Ala Leu Tyr Arg Gln Val Leu Asp Val Pro Gly Val Ile Met	
65 70 75 80	
gag ttc ggc gtc cgg ttc ggc cgt cac ctc ggc acg ttc gcc gcc ctg	288
Glu Phe Gly Val Arg Phe Gly Arg His Leu Gly Thr Phe Ala Ala Leu	
85 90 95	
cgc ggt gtc tac gag ccc tac aac ccg ctg cgc cgc atc gtc ggc ttc	336
Arg Gly Val Tyr Glu Pro Tyr Asn Pro Leu Arg Arg Ile Val Gly Phe	
100 105 110	
gac acc ttc acc ggc ttc ccc gac gtc aac gac gtc gac cgc gtc ggc	384
Asp Thr Phe Thr Gly Phe Pro Asp Val Asn Asp Val Asp Arg Val Gly	
115 120 125	
ccc acg gcg tac cag ggc cgc ttc gca gtg ccc ggg ggc tat ccg gcg	432
Pro Thr Ala Tyr Gln Gly Arg Phe Ala Val Pro Gly Gly Tyr Pro Ala	
130 135 140	
tac ctg aaa gag gtg ctg gac gcg cac gag tgc agc gac ttc ttc ggc	480
Tyr Leu Lys Glu Val Leu Asp Ala His Glu Cys Ser Asp Phe Phe Gly	
145 150 155 160	
cac gtg acg cag cgc agc gtg ctc gtc gag ggg gac gta cgg gag acg	528
His Val Thr Gln Arg Ser Val Leu Val Glu Gly Asp Val Arg Glu Thr	
165 170 175	
gtg ccg cgc tac ctc gcg gag aac ccg cag acc gtc atc gcg ctg gcg	576
Val Pro Arg Tyr Leu Ala Glu Asn Pro Gln Thr Val Ile Ala Leu Ala	
180 185 190	
tac ttc gac ctc gac ctc tac gag ccg acg aag gcc gtc ctg gag gcg	624
Tyr Phe Asp Leu Asp Leu Tyr Glu Pro Thr Lys Ala Val Leu Glu Ala	
195 200 205	
atc cgc ccc tac ctc acc aag ggc agc atc gtc gcc ttc gac gaa ctc	672
Ile Arg Pro Tyr Leu Thr Lys Gly Ser Ile Val Ala Phe Asp Glu Leu	
210 215 220	
gac aat ccg aag tgg ccc ggc gag aac atc gcg atg cgg aag gtg ctc	720
Asp Asn Pro Lys Trp Pro Gly Glu Asn Ile Ala Met Arg Lys Val Leu	
225 230 235 240	
ggg ctg gac cac gcc ccg ctg cgc ctg ctg ccg ggc cgc ccg gcg ccg	768
Gly Leu Asp His Ala Pro Leu Arg Leu Leu Pro Gly Arg Pro Ala Pro	
245 250 255	

gcg tac ctg cgg tgg ggc gac tga
 Ala Tyr Leu Arg Trp Gly Asp *
 260

792

<210> 12
 <211> 263
 <212> PRT
 <213> Bacteria

<400> 12
 Met Arg Trp Arg Leu Arg Met Asp Ser Gly Asp Gly Gln Asp Leu Arg
 1 5 10 15
 Ala Phe Val His Asp Ser Pro Glu Glu Thr Glu Thr Thr Gln Arg Leu
 20 25 30
 Thr Lys Leu Leu Thr Asn Ser Pro Ile Pro Thr Glu Glu Leu Val Asn
 35 40 45
 Asn Leu Pro Leu Phe Leu Arg Arg His Gln Met Thr Asp Leu Leu Ser
 50 55 60
 Met Asp Ala Leu Tyr Arg Gln Val Leu Asp Val Pro Gly Val Ile Met
 65 70 75 80
 Glu Phe Gly Val Arg Phe Gly Arg His Leu Gly Thr Phe Ala Ala Leu
 85 90 95
 Arg Gly Val Tyr Glu Pro Tyr Asn Pro Leu Arg Arg Ile Val Gly Phe
 100 105 110
 Asp Thr Phe Thr Gly Phe Pro Asp Val Asn Asp Val Asp Arg Val Gly
 115 120 125
 Pro Thr Ala Tyr Gln Gly Arg Phe Ala Val Pro Gly Gly Tyr Pro Ala
 130 135 140
 Tyr Leu Lys Glu Val Leu Asp Ala His Glu Cys Ser Asp Phe Phe Gly
 145 150 155 160
 His Val Thr Gln Arg Ser Val Leu Val Glu Gly Asp Val Arg Glu Thr
 165 170 175
 Val Pro Arg Tyr Leu Ala Glu Asn Pro Gln Thr Val Ile Ala Leu Ala
 180 185 190
 Tyr Phe Asp Leu Asp Leu Tyr Glu Pro Thr Lys Ala Val Leu Glu Ala
 195 200 205
 Ile Arg Pro Tyr Leu Thr Lys Gly Ser Ile Val Ala Phe Asp Glu Leu
 210 215 220
 Asp Asn Pro Lys Trp Pro Gly Glu Asn Ile Ala Met Arg Lys Val Leu
 225 230 235 240
 Gly Leu Asp His Ala Pro Leu Arg Leu Leu Pro Gly Arg Pro Ala Pro
 245 250 255
 Ala Tyr Leu Arg Trp Gly Asp
 260

<210> 13
 <211> 738
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(738)

<400> 13

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Met Phe Gly Pro Glu His Ala Glu Val Tyr Glu Ala Ala Tyr Arg Gly	
1 5 10 15	
cgc ggc aag agc tgg cac gac gag gcg gcg gac gtg gcc gac cgg atc	96
Arg Gly Lys Ser Trp His Asp Glu Ala Ala Asp Val Ala Asp Arg Ile	
20 25 30	
cgg gcc gcc cgc ccc gac gcc gcc cgg ctg ctc gac gtc ggc tgc ggc	144
Arg Ala Ala Arg Pro Asp Ala Ala Arg Leu Leu Asp Val Gly Cys Gly	
35 40 45	
acc ggc gcg cac ctc gag acc ttc gcg acc cgc ttc ccc cac gtg gag	192
Thr Gly Ala His Leu Glu Thr Phe Ala Thr Arg Phe Pro His Val Glu	
50 55 60	
ggg ctc gaa ctg gcc ccg gcg atg ctg gcg ctc gcc cga cac cgg ctg	240
Gly Leu Glu Leu Ala Pro Ala Met Leu Ala Leu Ala Arg His Arg Leu	
65 70 75 80	
ccc ggg gtg cgc ctg cac gcc ggg gac atg cgg acg ttc gac ctt ggc	288
Pro Gly Val Arg Leu His Ala Gly Asp Met Arg Thr Phe Asp Leu Gly	
85 90 95	
gtc acg ttc gac gcg gtg acc tgc ctg ttc acc gcg gtc aac ttc ctc	336
Val Thr Phe Asp Ala Val Thr Cys Leu Phe Thr Ala Val Asn Phe Leu	
100 105 110	
ggc acg gtg gcc gag atg cgg gcg gcc gtg gcc gcg atg tcg gcc cac	384
Gly Thr Val Ala Glu Met Arg Ala Ala Val Ala Ala Met Ser Ala His	
115 120 125	
ctg gcg ccg ggc ggc gtg ctg gtg ctc gaa ccg tgg tgg ttc ccg gag	432
Leu Ala Pro Gly Gly Val Leu Val Leu Glu Pro Trp Trp Phe Pro Glu	
130 135 140	
cgg ttc atc gac ggg tac gtc ggc ggc gac ctg gtg cgc gag gag ggc	480
Arg Phe Ile Asp Gly Tyr Val Gly Gly Asp Leu Val Arg Glu Glu Gly	
145 150 155 160	
cgc acg gtg gcg cgg gtg tcg cgg tcc acc cgg cag gga cgg gtg acg	528
Arg Thr Val Ala Arg Val Ser Arg Ser Thr Arg Gln Gly Arg Val Thr	
165 170 175	
cgg atg gag gag cgc tgg ctc gtc ggc gac gcc gcc ggg atc cgg gag	576
Arg Met Glu Glu Arg Trp Leu Val Gly Asp Ala Ala Gly Ile Arg Glu	
180 185 190	
ttc agc cag gtc ggc ctg ctc acc atg ttc acc cgc gag gag tac gac	624
Phe Ser Gln Val Gly Leu Leu Thr Met Phe Thr Arg Glu Glu Tyr Asp	
195 200 205	
gcg gcg ttc gcc gct gcc ggc tgc gag tcc gcg tac gtc gag ggc tgg	672
Ala Ala Phe Ala Ala Ala Gly Cys Glu Ser Ala Tyr Val Glu Gly Trp	
210 215 220	

ctg acc ggc cgg ggc ctt ttc gtg gcg acg cgt acc ggt gga cac gcc 720
 Leu Thr Gly Arg Gly Leu Phe Val Ala Thr Arg Thr Gly Gly His Ala
 225 230 235 240

acc ccg aca atg gtt tga 738
 Thr Pro Thr Met Val *
 245

<210> 14
 <211> 245
 <212> PRT
 <213> Bacteria

<400> 14
 Met Phe Gly Pro Glu His Ala Glu Val Tyr Glu Ala Ala Tyr Arg Gly
 1 5 10 15
 Arg Gly Lys Ser Trp His Asp Glu Ala Ala Asp Val Ala Asp Arg Ile
 20 25 30
 Arg Ala Ala Arg Pro Asp Ala Ala Arg Leu Leu Asp Val Gly Cys Gly
 35 40 45
 Thr Gly Ala His Leu Glu Thr Phe Ala Thr Arg Phe Pro His Val Glu
 50 55 60
 Gly Leu Glu Leu Ala Pro Ala Met Leu Ala Leu Ala Arg His Arg Leu
 65 70 75 80
 Pro Gly Val Arg Leu His Ala Gly Asp Met Arg Thr Phe Asp Leu Gly
 85 90 95
 Val Thr Phe Asp Ala Val Thr Cys Leu Phe Thr Ala Val Asn Phe Leu
 100 105 110
 Gly Thr Val Ala Glu Met Arg Ala Ala Val Ala Ala Met Ser Ala His
 115 120 125
 Leu Ala Pro Gly Gly Val Leu Val Leu Glu Pro Trp Trp Phe Pro Glu
 130 135 140
 Arg Phe Ile Asp Gly Tyr Val Gly Gly Asp Leu Val Arg Glu Glu Gly
 145 150 155 160
 Arg Thr Val Ala Arg Val Ser Arg Ser Thr Arg Gln Gly Arg Val Thr
 165 170 175
 Arg Met Glu Glu Arg Trp Leu Val Gly Asp Ala Ala Gly Ile Arg Glu
 180 185 190
 Phe Ser Gln Val Gly Leu Leu Thr Met Phe Thr Arg Glu Glu Tyr Asp
 195 200 205
 Ala Ala Phe Ala Ala Ala Gly Cys Glu Ser Ala Tyr Val Glu Gly Trp
 210 215 220
 Leu Thr Gly Arg Gly Leu Phe Val Ala Thr Arg Thr Gly Gly His Ala
 225 230 235 240
 Thr Pro Thr Met Val
 245

<210> 15
 <211> 1707
 <212> DNA
 <213> Bacteria

<220>

<221> CDS

<222> (1)...(1707)

<400> 15

gtg	ccg	gac	cac	gac	cag	cag	cct	cgc	cac	ggc	ggc	acg	ctg	cgc	tac	48
Val	Pro	Asp	His	Asp	Gln	Gln	Pro	Arg	His	Gly	Gly	Thr	Leu	Arg	Tyr	
1				5				10						15		
tac	ggg	ccc	ggg	ggc	ctc	gac	cac	ctg	gac	ccc	gcc	gcc	gcg	tac	tac	96
Tyr	Gly	Pro	Gly	Gly	Leu	Asp	His	Leu	Asp	Pro	Ala	Ala	Ala	Tyr	Tyr	
			20					25						30		
gcc	ttc	tcc	cac	cag	gtc	atc	cgg	ctc	ttc	gcc	cgg	cag	ctg	ttc	agc	144
Ala	Phe	Ser	His	Gln	Val	Ile	Arg	Leu	Phe	Ala	Arg	Gln	Leu	Phe	Ser	
		35					40					45				
tac	ccg	acc	acg	gag	gac	gcc	gcc	gcg	ctg	gtg	ccg	gtg	ccc	gac	gtg	192
Tyr	Pro	Thr	Thr	Glu	Asp	Ala	Ala	Ala	Leu	Val	Pro	Val	Pro	Asp	Val	
	50					55					60					
gcc	gcc	gag	ttg	ccc	acg	gtg	gac	aat	ggc	ggg	ctc	agc	gag	gac	ggc	240
Ala	Ala	Glu	Leu	Pro	Thr	Val	Asp	Asn	Gly	Gly	Leu	Ser	Glu	Asp	Gly	
65					70				75						80	
cgc	acg	tac	acg	atc	cgc	ctg	cgc	gac	ggg	gtc	cgg	tgg	gac	acc	gcc	288
Arg	Thr	Tyr	Thr	Ile	Arg	Leu	Arg	Asp	Gly	Val	Arg	Trp	Asp	Thr	Ala	
				85					90					95		
ccg	ccg	cgg	ccg	gtg	acc	gcg	ggg	gac	ttc	gtg	cgc	ggc	ttc	aag	cgg	336
Pro	Pro	Arg	Pro	Val	Thr	Ala	Gly	Asp	Phe	Val	Arg	Gly	Phe	Lys	Arg	
			100					105					110			
atg	gcc	aac	ccg	gtc	gcc	ggg	gcc	ggc	gcc	atc	gcc	tac	tac	acg	agc	384
Met	Ala	Asn	Pro	Val	Ala	Gly	Ala	Gly	Ala	Ile	Ala	Tyr	Tyr	Thr	Ser	
	115						120					125				
acc	atc	gcc	ggc	atg	gcg	gag	ttc	gcc	gag	ggc	tac	cgc	gcg	cgc	ttc	432
Thr	Ile	Ala	Gly	Met	Ala	Glu	Phe	Ala	Glu	Gly	Tyr	Arg	Ala	Arg	Phe	
	130					135					140					
gcc	ggg	cgt	acg	ccc	acc	gcc	gcc	gag	ctg	gcc	gac	tac	cag	aac	ggc	480
Ala	Gly	Arg	Thr	Pro	Thr	Ala	Ala	Glu	Leu	Ala	Asp	Tyr	Gln	Asn	Gly	
145					150					155					160	
cac	gag	atc	agc	ggg	ctg	tgg	gcc	aag	gac	gac	cgg	acc	ctg	gtg	atc	528
His	Glu	Ile	Ser	Gly	Leu	Trp	Ala	Lys	Asp	Asp	Arg	Thr	Leu	Val	Ile	
				165					170					175		
gag	ctg	ctg	cgc	ccc	gcc	aac	gac	atg	ctc	aac	ctg	ctg	gcg	atg	ccg	576
Glu	Leu	Leu	Arg	Pro	Ala	Asn	Asp	Met	Leu	Asn	Leu	Leu	Ala	Met	Pro	
			180					185					190			
ttc	gcc	tcc	gcc	gcg	ccc	cgg	gag	ttc	gac	gac	ctc	gtc	ccg	gac	ggg	624
Phe	Ala	Ser	Ala	Ala	Pro	Arg	Glu	Phe	Asp	Asp	Leu	Val	Pro	Asp	Gly	
		195					200					205				

ccg gac ttc gcg cgg ctg gtc cgc tcc aac ggg ccg tac cgg atc acc	672
Pro Asp Phe Ala Arg Leu Val Arg Ser Asn Gly Pro Tyr Arg Ile Thr	
210 215 220	
ggc tac gcc cgg ggc agc cac ctg acc atg gac cac aac ccc gcc tgg	720
Gly Tyr Ala Arg Gly Ser His Leu Thr Met Asp His Asn Pro Ala Trp	
225 230 235 240	
cgg gcc gac gca gac ccg atc cgc cgc cgc tac gtg gac cgt atc gag	768
Arg Ala Asp Ala Asp Pro Ile Arg Arg Arg Tyr Val Asp Arg Ile Glu	
245 250 255	
gtg cgg atg gcg agg gtg agc gac gag cgg gtc cgc gcc gag atc gag	816
Val Arg Met Ala Arg Val Ser Asp Glu Arg Val Arg Ala Glu Ile Glu	
260 265 270	
agc ggg gcg gcc gac ctg tcg tgg ggc gcc gcc gtg ggc agg ccc cgc	864
Ser Gly Ala Ala Asp Leu Ser Trp Gly Ala Ala Val Gly Arg Pro Arg	
275 280 285	
cgg cgt acg gcg gcc gac cgg aac ctc ggc tgg gcg ctg aac ccc tac	912
Arg Arg Thr Ala Ala Asp Arg Asn Leu Gly Trp Ala Leu Asn Pro Tyr	
290 295 300	
ctg gcg ttc aac ctg cac agc ccg cac gag cgg ggg gcg ctg cgc gac	960
Leu Ala Phe Asn Leu His Ser Pro His Glu Arg Gly Ala Leu Arg Asp	
305 310 315 320	
cgg acc gtc cgg ctg gcg atc gcg tac gcc gtc gac aag gcg cgg ctc	1008
Arg Thr Val Arg Leu Ala Ile Ala Tyr Ala Val Asp Lys Ala Arg Leu	
325 330 335	
gtc cgg ttc ttc gac gac atg aac atc ggc acg gtg acc cgc ccc gcg	1056
Val Arg Phe Phe Asp Asp Met Asn Ile Gly Thr Val Thr Arg Pro Ala	
340 345 350	
cac acg gcc atc ccg ccg ggc aac ttc ggc cac cgc gag tac gac ccg	1104
His Thr Ala Ile Pro Pro Gly Asn Phe Gly His Arg Glu Tyr Asp Pro	
355 360 365	
tac ccg acg ccg ggg gac cgg ggc gac cgg gcg cgc tgc cgg gag ctg	1152
Tyr Pro Thr Pro Gly Asp Arg Gly Asp Arg Ala Arg Cys Arg Glu Leu	
370 375 380	
ctc gcc gag gcc ggg tac ccc gac ggg ctg cgg ctc acc atg atc tac	1200
Leu Ala Glu Ala Gly Tyr Pro Asp Gly Leu Arg Leu Thr Met Ile Tyr	
385 390 395 400	
cgg atc gac gcg gtg cac ggc cag gtg gcc aag gcg atc gcc gag gac	1248
Arg Ile Asp Ala Val His Gly Gln Val Ala Lys Ala Ile Ala Glu Asp	
405 410 415	
ctg ggc gcg ggc ggc gtc gac gtc cgg ctg gtc gag atc gac cag acc	1296
Leu Gly Ala Gly Gly Val Asp Val Arg Leu Val Glu Ile Asp Gln Thr	
420 425 430	

gac gag tac tac cgc atc ctc cag gac ccg gcc cgc gcg gcg gcg ggg 1344
 Asp Glu Tyr Tyr Arg Ile Leu Gln Asp Pro Ala Arg Ala Ala Ala Gly
 435 440 445

gag tgg gac atc acg ccg gcc gcc tgg atg ccg gac tgg ttc ggc aac 1392
 Glu Trp Asp Ile Thr Pro Ala Ala Trp Met Pro Asp Trp Phe Gly Asn
 450 455 460

aac ggg cgg tcg tac gtc cag ccg atg ttc cag tcc aac acc ggc gtc 1440
 Asn Gly Arg Ser Tyr Val Gln Pro Met Phe Gln Ser Asn Thr Gly Val
 465 470 475 480

ggc acg gcc aac tac ggc ggc tac cac aac ccg ctc gtc gac gag ctg 1488
 Gly Thr Ala Asn Tyr Gly Gly Tyr His Asn Pro Leu Val Asp Glu Leu
 485 490 495

atc gac cgc gcg ttg tcc gcc ccg acg gag gcc gag gcg gag gag ctg 1536
 Ile Asp Arg Ala Leu Ser Ala Arg Thr Glu Ala Glu Ala Glu Glu Leu
 500 505 510

tgg cac cgg gtc gac ccg cag gtg ctg cag gac gtg gcg atc gtg ccg 1584
 Trp His Arg Val Asp Arg Gln Val Leu Gln Asp Val Ala Ile Val Pro
 515 520 525

atc ctg gcc tgc gag ccg acc atc gag cac ctg acc agt tcc cgg gtg 1632
 Ile Leu Ala Cys Glu Pro Thr Ile Glu His Leu Thr Ser Ser Arg Val
 530 535 540

cgg ggg gcg atc ccg ctg ccg cac gtg gac cgc tgg tac gac gcg gcg 1680
 Arg Gly Ala Ile Pro Leu Pro His Val Asp Arg Trp Tyr Asp Ala Ala
 545 550 555 560

aac ctc tgg ctg gac ccg ccc gac tga 1707
 Asn Leu Trp Leu Asp Pro Pro Asp *
 565

<210> 16
 <211> 568
 <212> PRT
 <213> Bacteria

<400> 16
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 Tyr Gly Pro Gly Gly Leu Asp His Leu Asp Pro Ala Ala Ala Tyr Tyr
 20 25 30
 Ala Phe Ser His Gln Val Ile Arg Leu Phe Ala Arg Gln Leu Phe Ser
 35 40 45
 Tyr Pro Thr Thr Glu Asp Ala Ala Ala Leu Val Pro Val Pro Asp Val
 50 55 60
 Ala Ala Glu Leu Pro Thr Val Asp Asn Gly Gly Leu Ser Glu Asp Gly
 65 70 75 80
 Arg Thr Tyr Thr Ile Arg Leu Arg Asp Gly Val Arg Trp Asp Thr Ala
 85 90 95
 Pro Pro Arg Pro Val Thr Ala Gly Asp Phe Val Arg Gly Phe Lys Arg

560

<400> 17																
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Met	Asp	Arg	Leu	Gln	Ser	Ala	Leu	Ala	Leu	Tyr	Glu	Glu	Ala	Met	Gly	
1				5				10						15		
tac	acg	tac	gcg	gca	gcc	ctg	cgg	gcc	gcc	gcc	gcc	gtc	ggc	gtc	gcc	96
Tyr	Thr	Tyr	Ala	Ala	Ala	Leu	Arg	Ala	Ala	Ala	Ala	Val	Gly	Val	Ala	
			20				25						30			
gac	cac	ctg	gtc	gac	ggc	ccc	cgt	acg	ccc	gcc	gag	ctg	gcc	gcc	gcg	144
Asp	His	Leu	Val	Asp	Gly	Pro	Arg	Thr	Pro	Ala	Glu	Leu	Ala	Ala	Ala	
		35				40						45				
acg	ggc	acc	gac	gcg	gac	gcg	ctc	cgc	cgg	gtg	ctg	cgc	ctg	ctg	gcg	192
Thr	Gly	Thr	Asp	Ala	Asp	Ala	Leu	Arg	Arg	Val	Leu	Arg	Leu	Leu	Ala	
50						55						60				
gtc	cgc	gac	gtg	gtc	cgc	gag	tcc	gac	ggc	cgg	ttc	gcg	ctg	acc	gac	240
Val	Arg	Asp	Val	Val	Arg	Glu	Ser	Asp	Gly	Arg	Phe	Ala	Leu	Thr	Asp	
65						70				75				80		
aag	ggc	gcg	gcg	ctg	cgg	tcg	gac	tcg	cgc	gtg	ccc	gcg	cgg	gcc	ggc	288
Lys	Gly	Ala	Ala	Leu	Arg	Ser	Asp	Ser	Pro	Val	Pro	Ala	Arg	Ala	Gly	
				85				90						95		
atc	ctc	atg	ttc	acc	gac	acg	atg	ttc	tgg	acg	atg	agt	cac	cgg	gtg	336
Ile	Leu	Met	Phe	Thr	Asp	Thr	Met	Phe	Trp	Thr	Met	Ser	His	Arg	Val	
			100				105						110			
gcg	agc	gcg	ctg	ggg	ccg	gag	cga	ccc	gcc	ttc	gcc	gac	atc	ttc	ggc	384
Ala	Ser	Ala	Leu	Gly	Pro	Glu	Arg	Pro	Ala	Phe	Ala	Asp	Ile	Phe	Gly	
		115				120						125				
agc	tcg	ctg	gac	gcc	tac	ttc	gac	ggc	gac	gcc	gag	gtc	gag	gcg	ctc	432
Ser	Ser	Leu	Asp	Ala	Tyr	Phe	Asp	Gly	Asp	Ala	Glu	Val	Glu	Ala	Leu	
130						135						140				
tac	tac	gag	ggc	atg	gaa	acg	gtc	agc	gcg	gcg	gag	cac	ctc	att	ctc	480
Tyr	Tyr	Glu	Gly	Met	Glu	Thr	Val	Ser	Ala	Ala	Glu	His	Leu	Ile	Leu	
145				150						155				160		
gcc	cgc	gcc	ggt	gac	ttc	ccc	gcc	acc	ggc	acc	gtg	gcg	gac	gtc	ggc	528

Ala Arg Ala Gly Asp Phe Pro Ala Thr Gly Thr Val Ala Asp Val Gly	
165 170 175	
ggc ggc cgg ggc ggc ttc ctg ctc acc gtc cta cgc gag cac ccc ggc	576
Gly Gly Arg Gly Gly Phe Leu Leu Thr Val Leu Arg Glu His Pro Gly	
180 185 190	
ctg cag ggc gtg ctg ctg gac cgc gcg gag gtg gtc gcc cgg cac cgg	624
Leu Gln Gly Val Leu Leu Asp Arg Ala Glu Val Val Ala Arg His Arg	
195 200 205	
ctg gac gcc ccg gac gtg gcg ggg cgc tgg aag gtt gtc gag ggc gac	672
Leu Asp Ala Pro Asp Val Ala Gly Arg Trp Lys Val Val Glu Gly Asp	
210 215 220	
ttc ctc cgc gag gtg ccc cac gcc gac gtg cac gtg ctc aag cgc atc	720
Phe Leu Arg Glu Val Pro His Ala Asp Val His Val Leu Lys Arg Ile	
225 230 235 240	
ctg cac aac tgg ggc gac gag gac agc gtc cgg atc ctg acg aac tgc	768
Leu His Asn Trp Gly Asp Glu Asp Ser Val Arg Ile Leu Thr Asn Cys	
245 250 255	
cgc cgg gtc atg ccc gcg cac ggc cgg gtg ctc gtg atc gac gcg gtc	816
Arg Arg Val Met Pro Ala His Gly Arg Val Leu Val Ile Asp Ala Val	
260 265 270	
gtc ccc gag ggc aac gac gcg cac cag agc aag gag atg gac ttc atg	864
Val Pro Glu Gly Asn Asp Ala His Gln Ser Lys Glu Met Asp Phe Met	
275 280 285	
atg ctc gcc gcg cgc acc ggc cag gaa cgc acc gcc gcc gag ctg gag	912
Met Leu Ala Ala Arg Thr Gly Gln Glu Arg Thr Ala Ala Glu Leu Glu	
290 295 300	
ccg ttg ttc acc gcg gcc ggg ctg cgc ctg gac cgg gtc gtc ggc acc	960
Pro Leu Phe Thr Ala Ala Gly Leu Arg Leu Asp Arg Val Val Gly Thr	
305 310 315 320	
tcg tcg gtc atg tcc atc gcg gtc ggc gtg ccg gcc tga	999
Ser Ser Val Met Ser Ile Ala Val Gly Val Pro Ala *	
325 330	

<210> 18
 <211> 332
 <212> PRT
 <213> Bacteria

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 Tyr Thr Tyr Ala Ala Ala Leu Arg Ala Ala Ala Val Gly Val Ala
 20 25 30
 Asp His Leu Val Asp Gly Pro Arg Thr Pro Ala Glu Leu Ala Ala Ala
 35 40 45

Thr Gly Thr Asp Ala Asp Ala Leu Arg Arg Val Leu Arg Leu Leu Ala
 50 55 60
 Val Arg Asp Val Val Arg Glu Ser Asp Gly Arg Phe Ala Leu Thr Asp
 65 70 75 80
 Lys Gly Ala Ala Leu Arg Ser Asp Ser Pro Val Pro Ala Arg Ala Gly
 85 90 95
 Ile Leu Met Phe Thr Asp Thr Met Phe Trp Thr Met Ser His Arg Val
 100 105 110
 Ala Ser Ala Leu Gly Pro Glu Arg Pro Ala Phe Ala Asp Ile Phe Gly
 115 120 125
 Ser Ser Leu Asp Ala Tyr Phe Asp Gly Asp Ala Glu Val Glu Ala Leu
 130 135 140
 Tyr Tyr Glu Gly Met Glu Thr Val Ser Ala Ala Glu His Leu Ile Leu
 145 150 155 160
 Ala Arg Ala Gly Asp Phe Pro Ala Thr Gly Thr Val Ala Asp Val Gly
 165 170 175
 Gly Gly Arg Gly Gly Phe Leu Leu Thr Val Leu Arg Glu His Pro Gly
 180 185 190
 Leu Gln Gly Val Leu Leu Asp Arg Ala Glu Val Val Ala Arg His Arg
 195 200 205
 Leu Asp Ala Pro Asp Val Ala Gly Arg Trp Lys Val Val Glu Gly Asp
 210 215 220
 Phe Leu Arg Glu Val Pro His Ala Asp Val His Val Leu Lys Arg Ile
 225 230 235 240
 Leu His Asn Trp Gly Asp Glu Asp Ser Val Arg Ile Leu Thr Asn Cys
 245 250 255
 Arg Arg Val Met Pro Ala His Gly Arg Val Leu Val Ile Asp Ala Val
 260 265 270
 Val Pro Glu Gly Asn Asp Ala His Gln Ser Lys Glu Met Asp Phe Met
 275 280 285
 Met Leu Ala Ala Arg Thr Gly Gln Glu Arg Thr Ala Ala Glu Leu Glu
 290 295 300
 Pro Leu Phe Thr Ala Ala Gly Leu Arg Leu Asp Arg Val Val Gly Thr
 305 310 315 320
 Ser Ser Val Met Ser Ile Ala Val Gly Val Pro Ala
 325 330

<210> 19
 <211> 1323
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(1323)

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 Val Ser Arg Thr Val Glu Ser Pro Gly Pro Ala Thr Val Ser Ala Ser
 1 5 10 15
 ccg gcg cag agt ccg ctg cgc acc gcg tcc tgg gcc cgc atc cgc gag 96
 Pro Ala Gln Ser Pro Leu Arg Thr Ala Ser Trp Ala Arg Ile Arg Glu
 20 25 30

ctg ttc gcc ctg gac ccg acg acc gtg cac ctc aac acg ggg acg gtc	144
Leu Phe Ala Leu Asp Pro Thr Thr Val His Leu Asn Thr Gly Thr Val	
35 40 45	
ggc gcc atg ccg tac gag gtg ctg gac acc gtg gac cgg gtg acc cgc	192
Gly Ala Met Pro Tyr Glu Val Leu Asp Thr Val Asp Arg Val Thr Arg	
50 55 60	
cag tgg acc ggc ggc ctg ctc gac gtc tac cgc ccg gcg atg ttc acc	240
Gln Trp Thr Gly Gly Leu Leu Asp Val Tyr Arg Pro Ala Met Phe Thr	
65 70 75 80	
gag tac cgg gac gcc atc gcg aag acg ttc ggc gtg gac ggc gac gag	288
Glu Tyr Arg Asp Ala Ile Ala Lys Thr Phe Gly Val Asp Gly Asp Glu	
85 90 95	
atc gtg atc tgc cac aac gcc acc gag ggg gtc gcc cgg gtc atc cac	336
Ile Val Ile Cys His Asn Ala Thr Glu Gly Val Ala Arg Val Ile His	
100 105 110	
ggc ctc gac ctg cgc gag ggc gac gag gtg gtg acg acc acg cac gag	384
Gly Leu Asp Leu Arg Glu Gly Asp Glu Val Val Thr Thr His Glu	
115 120 125	
tgc tac tcc gtg ctg tcc aac ttc aac ctg ctg cgc aac cgg ttc ggg	432
Cys Tyr Ser Val Leu Ser Asn Phe Asn Leu Leu Arg Asn Arg Phe Gly	
130 135 140	
gtg gtg ctg aag acc gtc acc ccg ccg tcc ggc cac gag gtg cgc gcg	480
Val Val Leu Lys Thr Val Thr Pro Pro Ser Gly His Glu Val Arg Ala	
145 150 155 160	
gag gag atc gtc gag ctg gtc gag gcc gcc atc acg ccc cgg acg aag	528
Glu Glu Ile Val Glu Leu Val Glu Ala Ala Ile Thr Pro Arg Thr Lys	
165 170 175	
gtg ctc tcg ttc gcc gcg atc acc ctc ttc acc ggg acg atg ttc ccc	576
Val Leu Ser Phe Ala Ala Ile Thr Leu Phe Thr Gly Thr Met Phe Pro	
180 185 190	
atc cgg cag ctc tgc gag ctg gcg cac cgg cac ggg ctg acc acc gtc	624
Ile Arg Gln Leu Cys Glu Leu Ala His Arg His Gly Leu Thr Thr Val	
195 200 205	
atc gac ggc gcg ctg atc ccc ggc atg ctc gac tgc gac ctg cgc gcg	672
Ile Asp Gly Ala Leu Ile Pro Gly Met Leu Asp Cys Asp Leu Arg Ala	
210 215 220	
acc ggg gcg gac ttc atc acc tgc tcc ggg tcg aag ttc cag tgc ggc	720
Thr Gly Ala Asp Phe Ile Thr Cys Ser Gly Ser Lys Phe Gln Cys Gly	
225 230 235 240	
ccg ctc ggc acc ggc ctg atc tac gtc cgc aac aag gtc gtc ccc gag	768
Pro Leu Gly Thr Gly Leu Ile Tyr Val Arg Asn Lys Val Val Pro Glu	
245 250 255	

cac aac ccc ctg ccg ctg ccc acg ttc tgg ccg ctc atc tcg acc tgg	816
His Asn Pro Leu Pro Leu Pro Thr Phe Trp Pro Leu Ile Ser Thr Trp	
260 265 270	
tac ccg atg atg ggc agc ccg ccg ccg cgg acc agc acc gcc gtg gag	864
Tyr Pro Met Met Gly Ser Pro Pro Pro Arg Thr Ser Thr Ala Val Glu	
275 280 285	
agc tac aac atg ggc gac ttc ctg cag agc gcc ggc agc gcc aac ctg	912
Ser Tyr Asn Met Gly Asp Phe Leu Gln Ser Ala Gly Ser Ala Asn Leu	
290 295 300	
gcg cgg ggc gcc gcc ctg gcc cgg gcc ttc gag ctg tgg gac gac atc	960
Ala Arg Gly Ala Ala Leu Ala Arg Ala Phe Glu Leu Trp Asp Asp Ile	
305 310 315 320	
ggc cgc gac cgc atc gag gcg tac atc atg gac ctc gcc gag tac gcc	1008
Gly Arg Asp Arg Ile Glu Ala Tyr Ile Met Asp Leu Ala Glu Tyr Ala	
325 330 335	
cgc ggc cgg ctc atc gac gcg ttc ggc gtc gag gcc atg tac tcc ccc	1056
Arg Gly Arg Leu Ile Asp Ala Phe Gly Val Glu Ala Met Tyr Ser Pro	
340 345 350	
ggc gcc gac ccg cgg ctg cgc tcg ccg ctg ctc gcg ttc aac ccg ttc	1104
Gly Ala Asp Pro Arg Leu Arg Ser Pro Leu Leu Ala Phe Asn Pro Phe	
355 360 365	
cgg cgg ccg gag gac gcc tgg aac atc aag aag ttc atc ggc ttc gtc	1152
Arg Arg Pro Glu Asp Ala Trp Asn Ile Lys Lys Phe Ile Gly Phe Val	
370 375 380	
aag cgc ctg gag acc gag cac cgg atc tgg acc cgc tgg acg gag ttc	1200
Lys Arg Leu Glu Thr Glu His Arg Ile Trp Thr Arg Trp Thr Glu Phe	
385 390 395 400	
gac gtg ccc ggc tcc ccg cac cag cac tac gcg gcg cgc atc acc acg	1248
Asp Val Pro Gly Ser Pro His Gln His Tyr Ala Ala Arg Ile Thr Thr	
405 410 415	
cac ctg ttc aac acc cgg gaa gag atc gac cac acc gta cgg acg atg	1296
His Leu Phe Asn Thr Arg Glu Glu Ile Asp His Thr Val Arg Thr Met	
420 425 430	
gtc cgc ctg gcc gag gag atg tct tga	1323
Val Arg Leu Ala Glu Glu Met Ser *	
435 440	

<210> 20
 <211> 440
 <212> PRT
 <213> Bacteria

<400> 20
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Leu Phe Ala Leu	Asp Pro Thr Thr	Val His Leu Asn Thr	Gly Thr Val
35	40	45	
Gly Ala Met Pro	Tyr Glu Val Leu	Asp Thr Val Asp Arg	Val Thr Arg
50	55	60	
Gln Trp Thr Gly	Gly Leu Leu Asp	Val Tyr Arg Pro	Ala Met Phe Thr
65	70	75	80
Glu Tyr Arg Asp	Ala Ile Ala Lys	Thr Phe Gly Val	Asp Gly Asp Glu
85	90	95	
Ile Val Ile Cys	His Asn Ala Thr	Glu Gly Val Ala	Arg Val Ile His
100	105	110	
Gly Leu Asp Leu	Arg Glu Gly Asp	Glu Val Val Thr	Thr Thr His Glu
115	120	125	
Cys Tyr Ser Val	Leu Ser Asn Phe	Asn Leu Leu Arg	Asn Arg Phe Gly
130	135	140	
Val Val Leu Lys	Thr Val Thr Pro	Pro Ser Gly His	Glu Val Arg Ala
145	150	155	160
Glu Glu Ile Val	Glu Leu Val Glu	Ala Ala Ile Thr	Pro Arg Thr Lys
165	170	175	
Val Leu Ser Phe	Ala Ala Ile Thr	Leu Phe Thr Gly	Thr Met Phe Pro
180	185	190	
Ile Arg Gln Leu	Cys Glu Leu Ala	His Arg His Gly	Leu Thr Thr Val
195	200	205	
Ile Asp Gly Ala	Leu Ile Pro Gly	Met Leu Asp Cys	Asp Leu Arg Ala
210	215	220	
Thr Gly Ala Asp	Phe Ile Thr Cys	Ser Gly Ser Lys	Phe Gln Cys Gly
225	230	235	240
Pro Leu Gly Thr	Gly Leu Ile Tyr	Val Arg Asn Lys	Val Val Pro Glu
245	250	255	
His Asn Pro Leu	Pro Leu Pro Thr	Phe Trp Pro Leu	Ile Ser Thr Trp
260	265	270	
Tyr Pro Met Met	Gly Ser Pro Pro	Arg Thr Ser Thr	Ala Val Glu
275	280	285	
Ser Tyr Asn Met	Gly Asp Phe Leu	Gln Ser Ala Gly	Ser Ala Asn Leu
290	295	300	
Ala Arg Gly Ala	Ala Leu Ala Arg	Ala Phe Glu Leu	Trp Asp Asp Ile
305	310	315	320
Gly Arg Asp Arg	Ile Glu Ala Tyr	Ile Met Asp Leu	Ala Glu Tyr Ala
325	330	335	
Arg Gly Arg Leu	Ile Asp Ala Phe	Gly Val Glu Ala	Met Tyr Ser Pro
340	345	350	
Gly Ala Asp Pro	Arg Leu Arg Ser	Pro Leu Leu Ala	Phe Asn Pro Phe
355	360	365	
Arg Arg Pro Glu	Asp Ala Trp Asn	Ile Lys Lys Phe	Ile Gly Phe Val
370	375	380	
Lys Arg Leu Glu	Thr Glu His Arg	Ile Trp Thr Arg	Trp Thr Glu Phe
385	390	395	400
Asp Val Pro Gly	Ser Pro His Gln	His Tyr Ala Ala	Arg Ile Thr Thr
405	410	415	
His Leu Phe Asn	Thr Arg Glu Glu	Ile Asp His Thr	Val Arg Thr Met
420	425	430	
Val Arg Leu Ala	Glu Glu Met Ser		
435	440		

<210> 21
 <211> 1683
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(1683)

<400> 21

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Val Thr Gln Ala Arg Ser Ala Thr Thr Thr Asn Asp Thr Arg Leu Arg	
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ggc acc ctg cgg ctg ctc ggg ccc gcc gcc gtc cac cag gcg gac ccg	96
Gly Thr Leu Arg Leu Leu Gly Pro Ala Ala Val His Gln Ala Asp Pro	
20 25 30	
gcc gcc gcc tgg tcg ccg gcc gag cgc cag ttg ctg cgg ctg tgc acc	144
Ala Ala Ala Trp Ser Pro Ala Glu Arg Gln Leu Leu Arg Leu Cys Thr	
35 40 45	
cgg cag ctg atc agc tac cgc ccg gaa ccc gac ccg ggc gac tgg cgc	192
Arg Gln Leu Ile Ser Tyr Arg Pro Glu Pro Asp Pro Gly Asp Trp Arg	
50 55 60	
gcc ctc gcg ccg gtc gcc gac ctg gcc acc gac gtc ccc tcg acc tac	240
Ala Leu Ala Pro Val Ala Asp Leu Ala Thr Asp Val Pro Ser Thr Tyr	
65 70 75 80	
aac gcc ggc ctg ggc gcc agc cac cgc agc tac gtg gtg cac ctg cgc	288
Asn Ala Gly Leu Gly Ala Ser His Arg Ser Tyr Val Val His Leu Arg	
85 90 95	
ccc ggg gtg ctc tgg gac acg ccg acc ccc cgc ccg gtg acg gcg cac	336
Pro Gly Val Leu Trp Asp Thr Pro Thr Pro Arg Pro Val Thr Ala His	
100 105 110	
gac gtc gta cgc ggc ttc aag cgg ctg gcc aac ccg ctc acc cga cac	384
Asp Val Val Arg Gly Phe Lys Arg Leu Ala Asn Pro Leu Thr Arg His	
115 120 125	
ccc gcg ctg gcg tac ttc cgg ggc acc ctg cgg ggc atg ggc cgg tac	432
Pro Ala Leu Ala Tyr Phe Arg Gly Thr Leu Arg Gly Met Gly Arg Tyr	
130 135 140	
tgc gac gag tac gcg gcg gcg gtc gcc ggc cac ccg gtc acc gcg gcg	480
Cys Asp Glu Tyr Ala Ala Ala Val Ala Gly His Pro Val Thr Ala Ala	
145 150 155 160	
ctg ctc gcc ggc ttc cag gac gcc cac gag atc ccc ggc gtg ttc gcc	528
Leu Leu Ala Gly Phe Gln Asp Ala His Glu Ile Pro Gly Val Phe Ala	
165 170 175	
gtc gac gac gag acg gtg gtc ttc gag ctg gac cgt ccg gcg ctg gac	576
Val Asp Asp Glu Thr Val Val Phe Glu Leu Asp Arg Pro Ala Leu Asp	

180	185	190	
ttc gtc gac atg ctg gcg cag agc ggc gcc tcc ccg gcc ccg gtg gag Phe Val Asp Met Leu Ala Gln Ser Gly Ala Ser Pro Ala Pro Val Glu 195 200 205			624
tac gac gca cac ctg ccg gga agc gcc ggc ctg cac gag cac ctg gtc Tyr Asp Ala His Leu Pro Gly Ser Ala Gly Leu His Glu His Leu Val 210 215 220			672
gcc aac ggc ccg tac cgc gtc gtg tcg tgg cgc ccc ggg ggc acc atc Ala Asn Gly Pro Tyr Arg Val Val Ser Trp Arg Pro Gly Gly Thr Ile 225 230 235 240			720
cgg ctg gag ccg aac ccg gcg tgg cgg gcg gag acc gac ccg atc cgc Arg Leu Glu Pro Asn Pro Ala Trp Arg Ala Glu Thr Asp Pro Ile Arg 245 250 255			768
gag cgg cgg ttc gac gcc gtc gag ttc cgc gtc gcc atg ggc ggg ccg Glu Arg Arg Phe Asp Ala Val Glu Phe Arg Val Ala Met Gly Gly Pro 260 265 270			816
cgc gaa ctg gcc gac cgg ctc gcc gcc gac gac gcc gac ctg ccg tgg Arg Glu Leu Ala Asp Arg Leu Ala Ala Asp Asp Ala Asp Leu Pro Trp 275 280 285			864
ggc gtg ccg atc ggc ccg gtg ccc ggt cag cgg ctc gac ccg tgc ctg Gly Val Pro Ile Gly Pro Val Pro Gly Gln Arg Leu Asp Pro Cys Leu 290 295 300			912
gtg ttc aac ctg cgc gac ccc gcc aac ccg gcc gtc gcc gac gcc gcg Val Phe Asn Leu Arg Asp Pro Ala Asn Pro Ala Val Ala Asp Ala Ala 305 310 315 320			960
gtg cgc cgg gtc gtc gcc ggg gcg gtc gac cgg gcg gcg ctg gtg cgc Val Arg Arg Val Val Ala Gly Ala Val Asp Arg Ala Ala Leu Val Arg 325 330 335			1008
atc gcc cgg gcc gcc gac ccg tgg tcc gag gtc cgc gcc gcg cac acc Ile Ala Arg Ala Ala Asp Pro Trp Ser Glu Val Arg Ala Ala His Thr 340 345 350			1056
gtc gtg ccg ccc ggc aac gac ggg cac cgg cag ccc gac ccg ctc acc Val Val Pro Pro Gly Asn Asp Gly His Arg Gln Pro Asp Pro Leu Thr 355 360 365			1104
gac ccg att ccc gac gcc gac gcg gac ccg cgc gag cgg ctc gcc gcc Asp Pro Ile Pro Asp Ala Asp Ala Asp Pro Arg Glu Arg Leu Ala Ala 370 375 380			1152
gcg ggg cac ccg gac ggg ctc acc ctg acc gcg gtg cac ccc gac acg Ala Gly His Pro Asp Gly Leu Thr Leu Thr Ala Val His Pro Asp Thr 385 390 395 400			1200
gcc gag gac ctg gcg ctg gcc cgc tcg tgg gcg gcc gac ctc ggc gcc Ala Glu Asp Leu Ala Leu Ala Arg Ser Trp Ala Ala Asp Leu Gly Ala			1248

405	410	415	
gcc ggc atc gac gta cgc ctg gtc	gcg ctc gac gac gcc aac cac cgg	1296	
Ala Gly Ile Asp Val Arg Leu Val	Ala Leu Asp Asp Ala Asn His Arg		
420	425 430		
gcc ctg ctc gcc gcc acg ggc gac	gcg ccc ggc ctg cga tgg gac ctg	1344	
Ala Leu Leu Ala Ala Thr Gly Asp	Ala Pro Gly Leu Arg Trp Asp Leu		
435	440 445		
gcg acc gcc acg ttc acc gcg ccg	tgg gcc tac ggc aac gcc cgg gtg	1392	
Ala Thr Ala Thr Phe Thr Ala Pro	Trp Ala Tyr Gly Asn Ala Arg Val		
450	455 460		
ttc ctg caa ccg ctg gtc ggc gag	gga ccc ggc aac ccc ggc ggc tac	1440	
Phe Leu Gln Pro Leu Val Gly Glu	Gly Pro Gly Asn Pro Gly Gly Tyr		
465	470 475 480		
cgc gac ccc ggg gtt gac cgg gtg	gtc gag cgc gcg ctg gac gcg gcc	1488	
Arg Asp Pro Gly Val Asp Arg Val	Val Glu Arg Ala Leu Asp Ala Ala		
485	490 495		
gac ccg cgc gag gcg gtc gcc ctg	tgg cag gag gtg gag cgg cgg ctg	1536	
Asp Pro Arg Glu Ala Val Ala Leu	Trp Gln Glu Val Glu Arg Arg Leu		
500	505 510		
ctc gcc gac gcc gcg gtc gta ccc	ctg ctg ttc cgg cgg gcc acg gac	1584	
Leu Ala Asp Ala Ala Val Val Pro	Leu Leu Phe Arg Arg Ala Thr Asp		
515	520 525		
gcc gcg ccg cgc ggg ccc cgg gtg	cgg cgc gcg acc gcc ctg ccg gcg	1632	
Ala Ala Pro Arg Gly Pro Arg Val	Arg Arg Ala Thr Ala Leu Pro Ala		
530	535 540		
ctc gcc ggc ctg ccc gac ctc gcc	gac gtg cgg ctc ggg gtg gac cgg	1680	
Leu Ala Gly Leu Pro Asp Leu Ala	Asp Val Arg Leu Gly Val Asp Arg		
545	550 555 560		
tga		1683	
*			

<210> 22
 <211> 560
 <212> PRT
 <213> Bacteria

<400> 22
 Val Thr Gln Ala Arg Ser Ala Thr Thr Thr Asn Asp Thr Arg Leu Arg
 1 5 10 15
 Gly Thr Leu Arg Leu Leu Gly Pro Ala Ala Val His Gln Ala Asp Pro
 20 25 30
 Ala Ala Ala Trp Ser Pro Ala Glu Arg Gln Leu Leu Arg Leu Cys Thr
 35 40 45
 Arg Gln Leu Ile Ser Tyr Arg Pro Glu Pro Asp Pro Gly Asp Trp Arg

50	55	60
Ala Leu Ala Pro Val	Ala Asp Leu Ala Thr	Asp Val Pro Ser Thr Tyr
65	70	75
Asn Ala Gly Leu Gly	Ala Ser His Arg Ser	Tyr Val Val His Leu Arg
85	90	95
Pro Gly Val Leu Trp	Asp Thr Pro Thr	Pro Arg Pro Val Thr Ala His
100	105	110
Asp Val Val Arg Gly	Phe Lys Arg Leu Ala	Asn Pro Leu Thr Arg His
115	120	125
Pro Ala Leu Ala Tyr	Phe Arg Gly Thr Leu	Arg Gly Met Gly Arg Tyr
130	135	140
Cys Asp Glu Tyr Ala	Ala Ala Val Ala Gly	His Pro Val Thr Ala Ala
145	150	155
Leu Leu Ala Gly Phe	Gln Asp Ala His Glu	Ile Pro Gly Val Phe Ala
165	170	175
Val Asp Asp Glu Thr	Val Val Phe Glu Leu	Asp Arg Pro Ala Leu Asp
180	185	190
Phe Val Asp Met Leu	Ala Gln Ser Gly Ala	Ser Pro Ala Pro Val Glu
195	200	205
Tyr Asp Ala His Leu	Pro Gly Ser Ala Gly	Leu His Glu His Leu Val
210	215	220
Ala Asn Gly Pro Tyr	Arg Val Val Ser Trp	Arg Pro Gly Gly Thr Ile
225	230	235
Arg Leu Glu Pro Asn	Pro Ala Trp Arg Ala	Glu Thr Asp Pro Ile Arg
245	250	255
Glu Arg Arg Phe Asp	Ala Val Glu Phe Arg	Val Ala Met Gly Gly Pro
260	265	270
Arg Glu Leu Ala Asp	Arg Leu Ala Ala Asp	Asp Ala Asp Leu Pro Trp
275	280	285
Gly Val Pro Ile Gly	Pro Val Pro Gly Gln	Arg Leu Asp Pro Cys Leu
290	295	300
Val Phe Asn Leu Arg	Asp Pro Ala Asn Pro	Ala Val Ala Asp Ala Ala
305	310	315
Val Arg Arg Val Val	Ala Gly Ala Val Asp	Arg Ala Ala Leu Val Arg
325	330	335
Ile Ala Arg Ala Ala	Asp Pro Trp Ser Glu	Val Arg Ala Ala His Thr
340	345	350
Val Val Pro Pro Gly	Asn Asp Gly His Arg	Gln Pro Asp Pro Leu Thr
355	360	365
Asp Pro Ile Pro Asp	Ala Asp Ala Asp Pro	Arg Glu Arg Leu Ala Ala
370	375	380
Ala Gly His Pro Asp	Gly Leu Thr Leu Thr	Ala Val His Pro Asp Thr
385	390	395
Ala Glu Asp Leu Ala	Leu Ala Arg Ser Trp	Ala Ala Asp Leu Gly Ala
405	410	415
Ala Gly Ile Asp Val	Arg Leu Val Ala Leu	Asp Asp Ala Asn His Arg
420	425	430
Ala Leu Leu Ala Ala	Thr Gly Asp Ala Pro	Gly Leu Arg Trp Asp Leu
435	440	445
Ala Thr Ala Thr Phe	Thr Ala Pro Trp Ala	Tyr Gly Asn Ala Arg Val
450	455	460
Phe Leu Gln Pro Leu	Val Gly Glu Gly Pro	Gly Asn Pro Gly Gly Tyr
465	470	475
Arg Asp Pro Gly Val	Asp Arg Val Val Glu	Arg Ala Leu Asp Ala Ala
485	490	495
Asp Pro Arg Glu Ala	Val Ala Leu Trp Gln	Glu Val Glu Arg Arg Leu

500	505	510
Leu Ala Asp Ala Ala Val Val	Pro Leu Leu Phe Arg Arg	Ala Thr Asp
515	520	525
Ala Ala Pro Arg Gly Pro Arg	Val Arg Arg Ala Thr Ala Leu Pro Ala	
530	535	540
Leu Ala Gly Leu Pro Asp Leu Ala Asp Val	Arg Leu Gly Val Asp Arg	
545	550	555
		560

<210> 23
 <211> 1248
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(1248)

<400> 23

gtg acc ggt gcc gcc gcc gac gcg gtg gtc gcc gac tac ctc gcg ctc	48
Val Thr Gly Ala Ala Ala Asp Ala Val Val Ala Asp Tyr Leu Ala Leu	
1 5 10 15	
ggg ctg cgg atg ggt cgg ctc gtc gag ggc tac gtc gac tgc tgg ttc	96
Gly Leu Arg Met Gly Arg Leu Val Glu Gly Tyr Val Asp Cys Trp Phe	
20 25 30	
ggc gac cgg gcc ctc gcc gag cgg gtc gcc gcg gag ccg gcg ccg gac	144
Gly Asp Arg Ala Leu Ala Glu Arg Val Ala Ala Glu Pro Ala Pro Asp	
35 40 45	
ccg gcg gag ctg gcc gga cag gcc cgc gac ctg ctg cgc cgc ctg ggc	192
Pro Ala Glu Leu Ala Gly Gln Ala Arg Asp Leu Leu Arg Arg Leu Gly	
50 55 60	
gac gcg gac ctc gac gcg gag cgg cgg cgg ttc ctc gcc gcg cag ctg	240
Asp Ala Asp Leu Asp Ala Glu Arg Arg Arg Phe Leu Ala Ala Gln Leu	
65 70 75 80	
acc gcg gtg gag tgc gcg gcc cgg cgg gcg gcg ggt gag cag atc ggc	288
Thr Ala Val Glu Cys Ala Ala Arg Arg Ala Ala Gly Glu Gln Ile Gly	
85 90 95	
ttc ctg gcc gag gtg gag acc tac ttc gac gtc gag gtg cgc ctc ggc	336
Phe Leu Ala Glu Val Glu Thr Tyr Phe Asp Val Glu Val Arg Leu Gly	
100 105 110	
gac ccg gac cgg tac gcc gcc gcg cac gac gcc atc gac gcg ctg ctg	384
Asp Pro Asp Arg Tyr Ala Ala Ala His Asp Ala Ile Asp Ala Leu Leu	
115 120 125	
ccg ggc acc ggc ccg ctg atg gac aag gtc gag gcg ttc tac gcc cgc	432
Pro Gly Thr Gly Pro Leu Met Asp Lys Val Glu Ala Phe Tyr Ala Arg	
130 135 140	
aac gtg gtg ccg ccg gag cgg ctg ggc cac gcc gtg cgg gcc gtc gcc	480

Asn Val Val Pro Pro Glu Arg Leu Gly His Ala Val Arg Ala Val Ala	
145 150 155 160	
gac gcg ctg cgc gcc cgt gcc cgg ccg atg ctc ggg ctg ccc gag gcc	528
Asp Ala Leu Arg Ala Arg Ala Arg Pro Met Leu Gly Leu Pro Glu Ala	
165 170 175	
gag cgg gtc gac atc gag gtg gtc cgc gac cgg ccg tgg aac gcg ttc	576
Glu Arg Val Asp Ile Glu Val Val Arg Asp Arg Pro Trp Asn Ala Phe	
180 185 190	
aac cgg tac cac ggc ggc ttc cgt tcc acg gtg acg ctg aac gag acg	624
Asn Arg Tyr His Gly Gly Phe Arg Ser Thr Val Thr Leu Asn Glu Thr	
195 200 205	
gcc ggc cgg acc atc gcc gtg ctg ccg ctg atg gcc acc cac gag gcg	672
Ala Gly Arg Thr Ile Ala Val Leu Pro Leu Met Ala Thr His Glu Ala	
210 215 220	
tac ccg ggc cac cac acc gag cac tgc ctc aag gag gcc ggg ctg gtg	720
Tyr Pro Gly His His Thr Glu His Cys Leu Lys Glu Ala Gly Leu Val	
225 230 235 240	
ctc gac cgg ggc tgg gac gag cac cgc atc gcc ctg gtc aac acc ccg	768
Leu Asp Arg Gly Trp Asp Glu His Arg Ile Ala Leu Val Asn Thr Pro	
245 250 255	
cag tgc ctg gtg gcg gag ggc acc gcc gag cac gcc gcg gcg gcg ctg	816
Gln Cys Leu Val Ala Glu Gly Thr Ala Glu His Ala Ala Ala Ala Leu	
260 265 270	
ctc ggg ccc ggc tgg gga cgg tgg acc acc gag gtg ctg gcc ggc gag	864
Leu Gly Pro Gly Trp Gly Arg Trp Thr Thr Glu Val Leu Ala Gly Glu	
275 280 285	
ggg gtg ccc gtc gag ggc gac ctc gtc gag cgg atg gtg ggg ctc gtc	912
Gly Val Pro Val Glu Gly Asp Leu Val Glu Arg Met Val Gly Leu Val	
290 295 300	
aac gag ctg atg ccg gcc cgg cag gac gcg gcg atc ctg ctg cac gac	960
Asn Glu Leu Met Pro Ala Arg Gln Asp Ala Ala Ile Leu Leu His Asp	
305 310 315 320	
cgg ggg gcg tcg atc gac gac gcg gtg gag cac ctg cac cgg tgg ctg	1008
Arg Gly Ala Ser Ile Asp Asp Ala Val Glu His Leu His Arg Trp Leu	
325 330 335	
ctg ctg ccg cgg gac cgg gcc gag cag atc gcc acc ttc ctg acc gac	1056
Leu Leu Pro Arg Asp Arg Ala Glu Gln Ile Ala Thr Phe Leu Thr Asp	
340 345 350	
ccg ctg tgg cgg gcc tac tcc gtg acg tac atc gag ggg gcc cgg ctg	1104
Pro Leu Trp Arg Ala Tyr Ser Val Thr Tyr Ile Glu Gly Ala Arg Leu	
355 360 365	
gtc ggc ggg tgg ctc gcc gcc cgg ccg gcc ggc gag ccg ctc gtc gcg	1152

Val	Gly	Gly	Trp	Leu	Ala	Ala	Arg	Pro	Ala	Gly	Glu	Pro	Leu	Val	Ala		
370						375					380						
cgg	tac	cgc	acc	ctg	ctg	gcg	gag	cag	ctc	ctt	ccc	gcg	cag	ctc	cgc	1200	
Arg	Tyr	Arg	Thr	Leu	Leu	Ala	Glu	Gln	Leu	Leu	Pro	Ala	Gln	Leu	Arg		
385				390					395					400			
gac	ggc	acg	gtc	ccc	gcg	ggc	gcg	ccg	ccc	gtg	ccc	gcg	gcc	cgc	tga	1248	
Asp	Gly	Thr	Val	Pro	Ala	Gly	Ala	Pro	Pro	Val	Pro	Ala	Ala	Arg	*		
				405				410						415			

<210> 24
 <211> 415
 <212> PRT
 <213> Bacteria

<400> 24

Val	Thr	Gly	Ala	Ala	Ala	Asp	Ala	Val	Val	Ala	Asp	Tyr	Leu	Ala	Leu		
1				5				10					15				
Gly	Leu	Arg	Met	Gly	Arg	Leu	Val	Glu	Gly	Tyr	Val	Asp	Cys	Trp	Phe		
			20					25					30				
Gly	Asp	Arg	Ala	Leu	Ala	Glu	Arg	Val	Ala	Ala	Glu	Pro	Ala	Pro	Asp		
			35				40					45					
Pro	Ala	Glu	Leu	Ala	Gly	Gln	Ala	Arg	Asp	Leu	Leu	Arg	Arg	Leu	Gly		
			50			55					60						
Asp	Ala	Asp	Leu	Asp	Ala	Glu	Arg	Arg	Arg	Phe	Leu	Ala	Ala	Gln	Leu		
65					70					75				80			
Thr	Ala	Val	Glu	Cys	Ala	Ala	Arg	Arg	Ala	Ala	Gly	Glu	Gln	Ile	Gly		
				85				90						95			
Phe	Leu	Ala	Glu	Val	Glu	Thr	Tyr	Phe	Asp	Val	Glu	Val	Arg	Leu	Gly		
			100					105					110				
Asp	Pro	Asp	Arg	Tyr	Ala	Ala	Ala	His	Asp	Ala	Ile	Asp	Ala	Leu	Leu		
			115				120					125					
Pro	Gly	Thr	Gly	Pro	Leu	Met	Asp	Lys	Val	Glu	Ala	Phe	Tyr	Ala	Arg		
			130			135					140						
Asn	Val	Val	Pro	Pro	Glu	Arg	Leu	Gly	His	Ala	Val	Arg	Ala	Val	Ala		
145					150					155				160			
Asp	Ala	Leu	Arg	Ala	Arg	Ala	Arg	Pro	Met	Leu	Gly	Leu	Pro	Glu	Ala		
			165					170						175			
Glu	Arg	Val	Asp	Ile	Glu	Val	Val	Arg	Asp	Arg	Pro	Trp	Asn	Ala	Phe		
			180					185					190				
Asn	Arg	Tyr	His	Gly	Gly	Phe	Arg	Ser	Thr	Val	Thr	Leu	Asn	Glu	Thr		
			195			200						205					
Ala	Gly	Arg	Thr	Ile	Ala	Val	Leu	Pro	Leu	Met	Ala	Thr	His	Glu	Ala		
			210			215					220						
Tyr	Pro	Gly	His	His	Thr	Glu	His	Cys	Leu	Lys	Glu	Ala	Gly	Leu	Val		
225					230					235				240			
Leu	Asp	Arg	Gly	Trp	Asp	Glu	His	Arg	Ile	Ala	Leu	Val	Asn	Thr	Pro		
			245					250					255				
Gln	Cys	Leu	Val	Ala	Glu	Gly	Thr	Ala	Glu	His	Ala	Ala	Ala	Ala	Leu		
			260					265					270				
Leu	Gly	Pro	Gly	Trp	Gly	Arg	Trp	Thr	Thr	Glu	Val	Leu	Ala	Gly	Glu		
			275				280					285					
Gly	Val	Pro	Val	Glu	Gly	Asp	Leu	Val	Glu	Arg	Met	Val	Gly	Leu	Val		

290	295	300
Asn Glu Leu Met Pro Ala Arg Gln Asp Ala Ala Ile Leu Leu His Asp		
305	310	315
Arg Gly Ala Ser Ile Asp Asp Ala Val Glu His Leu His Arg Trp Leu		
325	330	335
Leu Leu Pro Arg Asp Arg Ala Glu Gln Ile Ala Thr Phe Leu Thr Asp		
340	345	350
Pro Leu Trp Arg Ala Tyr Ser Val Thr Tyr Ile Glu Gly Ala Arg Leu		
355	360	365
Val Gly Gly Trp Leu Ala Ala Arg Pro Ala Gly Glu Pro Leu Val Ala		
370	375	380
Arg Tyr Arg Thr Leu Leu Ala Glu Gln Leu Leu Pro Ala Gln Leu Arg		
385	390	395
Asp Gly Thr Val Pro Ala Gly Ala Pro Pro Val Pro Ala Ala Arg		
405	410	415

<210> 25
 <211> 1194
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(1194)

<400> 25	
atg gcc cac ctc ctg atc gtc aac gtc gcc agc cac ggc ctg atc ctg	48
Met Ala His Leu Leu Ile Val Asn Val Ala Ser His Gly Leu Ile Leu	
1 5 10 15	
ccc acc ctc acc gtg gtc acc gag ctg gtc cgg cgc ggg cac cgg gtc	96
Pro Thr Leu Thr Val Val Thr Glu Leu Val Arg Arg Gly His Arg Val	
20 25 30	
agc tac gtc acc gcc ggc ggg ttc gcg gag ccg gtc cgt gcc gcc ggc	144
Ser Tyr Val Thr Ala Gly Gly Phe Ala Glu Pro Val Arg Ala Ala Gly	
35 40 45	
gcg acg gtg gtg ccc tac cag tcg gag atc atc gac gcg gac gcc gcc	192
Ala Thr Val Val Pro Tyr Gln Ser Glu Ile Ile Asp Ala Asp Ala Ala	
50 55 60	
gag gtg ttc ggc tcg gac gac ctc ggc gtc cgt ccc cac ctg atg tac	240
Glu Val Phe Gly Ser Asp Leu Gly Val Arg Pro His Leu Met Tyr	
65 70 75 80	
ctg cgg gag aac gtc tcg gtg ctc cgg gcc acc gcc gag gcg ctc gac	288
Leu Arg Glu Asn Val Ser Val Leu Arg Ala Thr Ala Glu Ala Leu Asp	
85 90 95	
ggc gac gtg ccg gac ctg gtc ctc tac gac gac ttc ccg ttc atc gcc	336
Gly Asp Val Pro Asp Leu Val Leu Tyr Asp Asp Phe Pro Phe Ile Ala	
100 105 110	
ggg cag ttg ctg gcc gcc cgc tgg cgg cgg gcc gtc cgg ctc agc	384

Gly	Gln	Leu	Leu	Ala	Ala	Arg	Trp	Arg	Arg	Pro	Ala	Val	Arg	Leu	Ser		
		115					120					125					
gcg	gcg	ttc	gcg	tcg	aac	gag	cac	tac	tcg	ttc	tcc	cag	gac	atg	gtc	432	
Ala	Ala	Phe	Ala	Ser	Asn	Glu	His	Tyr	Ser	Phe	Ser	Gln	Asp	Met	Val		
	130					135					140						
acc	ctg	gcc	ggc	acg	atc	gac	ccg	ctc	gac	ctg	ccg	gtg	ttc	cgc	gac	480	
Thr	Leu	Ala	Gly	Thr	Ile	Asp	Pro	Leu	Asp	Leu	Pro	Val	Phe	Arg	Asp		
145					150					155					160		
acc	ctg	cgg	gac	ctg	ctc	gcc	gag	cac	ggc	ctg	tcc	cgg	tcg	gtc	gtg	528	
Thr	Leu	Arg	Asp	Leu	Leu	Ala	Glu	His	Gly	Leu	Ser	Arg	Ser	Val	Val		
				165					170					175			
gac	tgc	tgg	aac	cac	gtg	gag	caa	ctc	aac	ctg	gtc	ttc	gtc	ccg	aag	576	
Asp	Cys	Trp	Asn	His	Val	Glu	Gln	Leu	Asn	Leu	Val	Phe	Val	Pro	Lys		
			180					185					190				
gcg	ttc	cag	atc	gcc	ggc	gac	acc	ttc	gac	gac	cgc	ttc	gtc	ttc	gtc	624	
Ala	Phe	Gln	Ile	Ala	Gly	Asp	Thr	Phe	Asp	Asp	Arg	Phe	Val	Phe	Val		
	195						200					205					
ggg	ccg	tgc	ttc	gac	gac	cgg	cgg	ttc	ctc	ggc	gag	tgg	acc	cgc	ccg	672	
Gly	Pro	Cys	Phe	Asp	Asp	Arg	Arg	Phe	Leu	Gly	Glu	Trp	Thr	Arg	Pro		
	210					215					220						
gcc	gac	gac	ctg	ccg	gtg	gtg	ctg	gtg	tcg	ctc	ggc	acc	acc	ttc	aac	720	
Ala	Asp	Asp	Leu	Pro	Val	Val	Leu	Val	Ser	Leu	Gly	Thr	Thr	Phe	Asn		
225					230					235					240		
gac	cgg	ccc	gga	ttc	ttc	cgc	gac	tgc	gcg	cgg	gcg	ttc	gac	ggc	cag	768	
Asp	Arg	Pro	Gly	Phe	Phe	Arg	Asp	Cys	Ala	Arg	Ala	Phe	Asp	Gly	Gln		
				245					250					255			
ccg	tgg	cac	gtg	gtg	atg	acg	ctg	ggc	ggc	cag	gtc	gac	ccg	gcg	gct	816	
Pro	Trp	His	Val	Val	Met	Thr	Leu	Gly	Gly	Gln	Val	Asp	Pro	Ala	Ala		
			260					265					270				
ctc	ggc	gac	ctg	ccc	ccc	aac	gtg	gag	gcg	cac	cgc	tgg	gtc	ccg	cac	864	
Leu	Gly	Asp	Leu	Pro	Pro	Asn	Val	Glu	Ala	His	Arg	Trp	Val	Pro	His		
		275					280					285					
gtg	aag	gtg	ctc	gaa	cag	gcg	acg	gtc	tgc	gtg	acg	cac	ggc	ggc	atg	912	
Val	Lys	Val	Leu	Glu	Gln	Ala	Thr	Val	Cys	Val	Thr	His	Gly	Gly	Met		
	290					295					300						
ggc	acc	ctc	atg	gag	gcg	ctc	tac	tgg	ggg	cgc	ccg	ctg	gtg	gtc	gtg	960	
Gly	Thr	Leu	Met	Glu	Ala	Leu	Tyr	Trp	Gly	Arg	Pro	Leu	Val	Val	Val		
305					310					315				320			
ccg	cag	tcc	ttc	gac	gtg	cag	ccg	atg	gcc	cgg	cgg	gtc	gac	cag	ctc	1008	
Pro	Gln	Ser	Phe	Asp	Val	Gln	Pro	Met	Ala	Arg	Arg	Val	Asp	Gln	Leu		
				325					330					335			
ggc	ctc	ggc	gcg	gtg	ctg	ccc	ggg	gag	aag	gcc	gac	ggc	gac	acg	ctg	1056	

Gly	Leu	Gly	Ala	Val	Leu	Pro	Gly	Glu	Lys	Ala	Asp	Gly	Asp	Thr	Leu	
			340					345					350			
ctc	gcc	gcc	gtc	ggg	gcc	gtc	gcg	gcc	gac	ccc	gcg	ctg	ctc	gcc	cgg	1104
Leu	Ala	Ala	Val	Gly	Ala	Val	Ala	Ala	Asp	Pro	Ala	Leu	Leu	Ala	Arg	
			355				360					365				
gtc	gag	gcc	atg	cgg	ggc	cac	gtc	cgc	cgg	gcc	ggg	ggc	gcg	gcc	cgg	1152
Val	Glu	Ala	Met	Arg	Gly	His	Val	Arg	Arg	Ala	Gly	Gly	Ala	Ala	Arg	
	370					375					380					
gcc	gcc	gac	gcc	gtg	gag	gcg	tac	ctg	gcc	cgc	gcc	cgc	tga			1194
Ala	Ala	Asp	Ala	Val	Glu	Ala	Tyr	Leu	Ala	Arg	Ala	Arg	*			
385					390					395						

<210> 26
 <211> 397
 <212> PRT
 <213> Bacteria

<400> 26

Met	Ala	His	Leu	Leu	Ile	Val	Asn	Val	Ala	Ser	His	Gly	Leu	Ile	Leu	
1				5					10					15		
Pro	Thr	Leu	Thr	Val	Val	Thr	Glu	Leu	Val	Arg	Arg	Gly	His	Arg	Val	
			20					25					30			
Ser	Tyr	Val	Thr	Ala	Gly	Gly	Phe	Ala	Glu	Pro	Val	Arg	Ala	Ala	Gly	
		35				40						45				
Ala	Thr	Val	Val	Pro	Tyr	Gln	Ser	Glu	Ile	Ile	Asp	Ala	Asp	Ala	Ala	
	50					55					60					
Glu	Val	Phe	Gly	Ser	Asp	Asp	Leu	Gly	Val	Arg	Pro	His	Leu	Met	Tyr	
65					70					75				80		
Leu	Arg	Glu	Asn	Val	Ser	Val	Leu	Arg	Ala	Thr	Ala	Glu	Ala	Leu	Asp	
			85					90					95			
Gly	Asp	Val	Pro	Asp	Leu	Val	Leu	Tyr	Asp	Asp	Phe	Pro	Phe	Ile	Ala	
		100					105						110			
Gly	Gln	Leu	Leu	Ala	Ala	Arg	Trp	Arg	Arg	Pro	Ala	Val	Arg	Leu	Ser	
	115					120						125				
Ala	Ala	Phe	Ala	Ser	Asn	Glu	His	Tyr	Ser	Phe	Ser	Gln	Asp	Met	Val	
	130				135					140						
Thr	Leu	Ala	Gly	Thr	Ile	Asp	Pro	Leu	Asp	Leu	Pro	Val	Phe	Arg	Asp	
145					150					155				160		
Thr	Leu	Arg	Asp	Leu	Leu	Ala	Glu	His	Gly	Leu	Ser	Arg	Ser	Val	Val	
			165					170					175			
Asp	Cys	Trp	Asn	His	Val	Glu	Gln	Leu	Asn	Leu	Val	Phe	Val	Pro	Lys	
		180					185					190				
Ala	Phe	Gln	Ile	Ala	Gly	Asp	Thr	Phe	Asp	Asp	Arg	Phe	Val	Phe	Val	
	195					200					205					
Gly	Pro	Cys	Phe	Asp	Asp	Arg	Arg	Phe	Leu	Gly	Glu	Trp	Thr	Arg	Pro	
	210				215					220						
Ala	Asp	Asp	Leu	Pro	Val	Leu	Val	Ser	Leu	Gly	Thr	Thr	Phe	Asn		
225				230					235					240		
Asp	Arg	Pro	Gly	Phe	Phe	Arg	Asp	Cys	Ala	Arg	Ala	Phe	Asp	Gly	Gln	
			245					250					255			
Pro	Trp	His	Val	Val	Met	Thr	Leu	Gly	Gly	Gln	Val	Asp	Pro	Ala	Ala	

tcg ctg cgc cgg ctc cag acc gac gcc atc gac ctc tac cag atg cac	384
Ser Leu Arg Arg Leu Gln Thr Asp Ala Ile Asp Leu Tyr Gln Met His	
115 120 125	
cac gtc gac cgg gag gtc ggc tgg gac gag atc tgg cag gcc atg gag	432
His Val Asp Arg Glu Val Gly Trp Asp Glu Ile Trp Gln Ala Met Glu	
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Gln Leu Val Arg Gln Gly Lys Val Arg Tyr Val Gly Ser Ser Asn Phe	
145 150 155 160	
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Ala Gly Trp Asp Leu Val Ser Ala Gln Glu Ala Ala Arg Arg His Arg	
165 170 175	
ctg ctc ggg ctg gcc agc gag cag tgc gtc tac aac ctg gtc agc cgg	576
Leu Leu Gly Leu Ala Ser Glu Gln Cys Val Tyr Asn Leu Val Ser Arg	
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tac gtc gaa ctg gag gtg ctc ccc gcc gcc gtc gcc gag ggc atc ggg	624
Tyr Val Glu Leu Glu Val Leu Pro Ala Ala Val Ala Glu Gly Ile Gly	
195 200 205	
gtg ctc gtc tgg tcg ccg ctg cac ggc ggg ctg ctc ggc ggc gtg ctg	672
Val Leu Val Trp Ser Pro Leu His Gly Gly Leu Leu Gly Gly Val Leu	
210 215 220	
cgg aag ctg gcc gac ggc acc gcg gtc aag tcc gcg cag gga cgg gcc	720
Arg Lys Leu Ala Asp Gly Thr Ala Val Lys Ser Ala Gln Gly Arg Ala	
225 230 235 240	
gcc gag gcg gtc gag cgg cac cgc gcg aca ctc gcc gcg tac gag acg	768
Ala Glu Ala Val Glu Arg His Arg Ala Thr Leu Ala Ala Tyr Glu Thr	
245 250 255	
ttc tgc gcc gag gcc ggc cgc gac ccg gcg gag gtc ggc atg gcc tgg	816
Phe Cys Ala Glu Ala Gly Arg Asp Pro Ala Glu Val Gly Met Ala Trp	
260 265 270	
gtg ctg cac cgc ccg gcg gtg acc gcc gcg gtc gtc ggt ccg cgt acc	864
Val Leu His Arg Pro Ala Val Thr Ala Ala Val Val Gly Pro Arg Thr	
275 280 285	
ccc gaa cac ctg gac ggc gcc ctg cgg gcc ctg cac cgg ccg ctg tcg	912
Pro Glu His Leu Asp Gly Ala Leu Arg Ala Leu His Arg Pro Leu Ser	
290 295 300	
gcg gcg gag ctc gcc cgg ctc gac gag ctg ttc ccg ccg ctc ggc cgg	960
Ala Ala Glu Leu Ala Arg Leu Asp Glu Leu Phe Pro Pro Leu Gly Arg	
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Gly Gly Ala Ala Pro Asp Ala Trp Met Ser *	
325 330	

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 <211> 330
 <212> PRT
 <213> Bacteria

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 35 40 45
 Val Asp Thr Ala Asp Ile Tyr Gly Trp Arg Val His Arg Gly Trp Thr
 50 55 60
 Glu Glu Met Ile Gly Arg Trp Leu Ala Lys Asp Pro Ala Arg Arg Asp
 65 70 75 80
 Glu Val Val Leu Ala Thr Lys Val Gly Asn Pro Met Gly Asp Gly Pro
 85 90 95
 Asn Ala Arg Gly Leu Ser Ala Arg His Val Val Ala Ala Cys Glu Ala
 100 105 110
 Ser Leu Arg Arg Leu Gln Thr Asp Ala Ile Asp Leu Tyr Gln Met His
 115 120 125
 His Val Asp Arg Glu Val Gly Trp Asp Glu Ile Trp Gln Ala Met Glu
 130 135 140
 Gln Leu Val Arg Gln Gly Lys Val Arg Tyr Val Gly Ser Ser Asn Phe
 145 150 155 160
 Ala Gly Trp Asp Leu Val Ser Ala Gln Glu Ala Ala Arg Arg His Arg
 165 170 175
 Leu Leu Gly Leu Ala Ser Glu Gln Cys Val Tyr Asn Leu Val Ser Arg
 180 185 190
 Tyr Val Glu Leu Glu Val Leu Pro Ala Ala Val Ala Glu Gly Ile Gly
 195 200 205
 Val Leu Val Trp Ser Pro Leu His Gly Gly Leu Leu Gly Gly Val Leu
 210 215 220
 Arg Lys Leu Ala Asp Gly Thr Ala Val Lys Ser Ala Gln Gly Arg Ala
 225 230 235 240
 Ala Glu Ala Val Glu Arg His Arg Ala Thr Leu Ala Ala Tyr Glu Thr
 245 250 255
 Phe Cys Ala Glu Ala Gly Arg Asp Pro Ala Glu Val Gly Met Ala Trp
 260 265 270
 Val Leu His Arg Pro Ala Val Thr Ala Ala Val Val Gly Pro Arg Thr
 275 280 285
 Pro Glu His Leu Asp Gly Ala Leu Arg Ala Leu His Arg Pro Leu Ser
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 305 310 315 320
 Gly Gly Ala Ala Pro Asp Ala Trp Met Ser
 325 330

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 <211> 543
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 <213> Bacteria

<220>

<221> CDS

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<400> 29

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gga cgg tcc tgg aag ggc acc ttc gat gag gtc atc cgg cgt ggc gag 96
Gly Arg Ser Trp Lys Gly Thr Phe Asp Glu Val Ile Arg Arg Gly Glu
20 25 30

ctg atg agc gac ccg tcc ctg ctg gtg acc aac ccg agc cgg acg gac 144
Leu Met Ser Asp Pro Ser Leu Leu Val Thr Asn Pro Ser Arg Thr Asp
35 40 45

ccg tcc gtg gcg ccc gcc ggc cgg cac acc tac tac gtg ctc gcg ccg 192
Pro Ser Val Ala Pro Ala Gly Arg His Thr Tyr Val Leu Ala Pro
50 55 60

gtg ccc aac ctc cac cgg gcg ccg ttc gac tgg cgg ggc gac ctc acc 240
Val Pro Asn Leu His Arg Ala Pro Phe Asp Trp Arg Gly Asp Leu Thr
65 70 75 80

gac cgc tac gcc gac cag ctc gtc ggg acc ctg gag gag cgc ggc tac 288
Asp Arg Tyr Ala Asp Gln Leu Val Gly Thr Leu Glu Glu Arg Gly Tyr
85 90 95

gtc ggc ttc ggc gcc ggc gtc gag gtg ctg cgg gcg gtc acc ccg gcc 336
Val Gly Phe Gly Ala Gly Val Glu Val Leu Arg Ala Val Thr Pro Ala
100 105 110

gag tgg gcg gag cag ggg atg gcc gcc ggc acc ccg ttc gcc gcc gcg 384
Glu Trp Ala Glu Gln Gly Met Ala Ala Gly Thr Pro Phe Ala Ala Ala
115 120 125

cac agc ttc ttc cag acc ggc ccg ttc cgc ccg tcg aac ctg cac cgg 432
His Ser Phe Phe Gln Thr Gly Pro Phe Arg Pro Ser Asn Leu His Arg
130 135 140

acg ctg ccg aac gtg gtc ttc gtc ggc tcc ggc acc cag ccc ggt gtc 480
Thr Leu Pro Asn Val Val Phe Val Gly Ser Gly Thr Gln Pro Gly Val
145 150 155 160

ggc gtg ccg atg gtg ctc atc tcc ggc aag ctc gcc gcc ggc cgc atc 528
Gly Val Pro Met Val Leu Ile Ser Gly Lys Leu Ala Ala Gly Arg Ile
165 170 175

acc ggg aga tcc tga 543
Thr Gly Arg Ser *
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<210> 30

<211> 180

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tcg tac gac ccg gtc ggc gcg gcg gac gtg gtg atc gtg acg gtc ggc	288
Ser Tyr Asp Pro Val Gly Ala Ala Asp Val Val Ile Val Thr Val Gly	
85 90 95	
acc ccg acc gac gcc ggc cac gag atg gtc acc gac cag ctc gtc gcg	336
Thr Pro Thr Asp Ala Gly His Glu Met Val Thr Asp Gln Leu Val Ala	
100 105 110	
gcg tgc gag cag atc gcc ccg cgg ctg cgc gcc ggg caa ctg gtg atc	384
Ala Cys Glu Gln Ile Ala Pro Arg Leu Arg Ala Gly Gln Leu Val Ile	
115 120 125	
ctc aag tcg acg gtc tcc ccg ggc acc acc cgg acc ctc gtc gcg ccc	432
Leu Lys Ser Thr Val Ser Pro Gly Thr Thr Arg Thr Leu Val Ala Pro	
130 135 140	
ctg ctg gag agc ggc ggg ctg gtg cac gag cgc gac ttc ggg ctg gcc	480
Leu Leu Glu Ser Gly Gly Leu Val His Glu Arg Asp Phe Gly Leu Ala	
145 150 155 160	
ttc tgc ccg gag cgg ctc gcc gag ggg gtg gcg ctg gcg cag gtg cgg	528
Phe Cys Pro Glu Arg Leu Ala Glu Gly Val Ala Leu Ala Gln Val Arg	
165 170 175	
acg ctg ccg gtg gtg gtg ggt ggg tgc ggc ccg cgc agc gcc gcc gcg	576
Thr Leu Pro Val Val Val Gly Gly Cys Gly Pro Arg Ser Ala Ala Ala	
180 185 190	
gcc gaa cgg ttc tgg cgg tcc gcg ctc ggc gtc gac gtc cgg cag gtg	624
Ala Glu Arg Phe Trp Arg Ser Ala Leu Gly Val Asp Val Arg Gln Val	
195 200 205	
ccg tcg gcc gag tcc gcc gag gtg gtc aag ctc gcg acc aac tgg tgg	672
Pro Ser Ala Glu Ser Ala Glu Val Val Lys Leu Ala Thr Asn Trp Trp	
210 215 220	
atc gac gcg aac gtg gcg atc gcc aac gaa ctc gcc cgg tac tgc gcg	720
Ile Asp Ala Asn Val Ala Ile Ala Asn Glu Leu Ala Arg Tyr Cys Ala	
225 230 235 240	
gtg ctg ggg gtg gac gtc ctc gac gtg atc ggc gcg gcg aac acc ctg	768
Val Leu Gly Val Asp Val Leu Asp Val Ile Gly Ala Ala Asn Thr Leu	
245 250 255	
ccc aag ggc agc agc atg gtg aac ctg ctg ctg ccg ggg gtg ggt gtc	816
Pro Lys Gly Ser Ser Met Val Asn Leu Leu Leu Pro Gly Val Gly Val	
260 265 270	
ggc ggc tcc tgc ctg acg aag gac ccg tgg atg gcg tgg cgg gac ggc	864
Gly Gly Ser Cys Leu Thr Lys Asp Pro Trp Met Ala Trp Arg Asp Gly	
275 280 285	

cgg gac cgg ggc gtg ccc ctg cgc acg gtc gag acg gcc cgc gcg gtc	912
Arg Asp Arg Gly Val Pro Leu Arg Thr Val Glu Thr Ala Arg Ala Val	
290 295 300	
aac gac gac atg ccc cgc cac acc gcc gcc gtc atc gcc gac gag ctg	960
Asn Asp Asp Met Pro Arg His Thr Ala Ala Val Ile Ala Asp Glu Leu	
305 310 315 320	
gtc aag ctg gga cgg gat cgg aac gac acg acg atc gcc gtg ctc ggc	1008
Val Lys Leu Gly Arg Asp Arg Asn Asp Thr Thr Ile Ala Val Leu Gly	
325 330 335	
gcg gcg ttc aag aac gac acc ggc gac gtc cgc aac acc ccg gtg cgc	1056
Ala Ala Phe Lys Asn Asp Thr Gly Asp Val Arg Asn Thr Pro Val Arg	
340 345 350	
ggg gtc gtg gcg gcg ctg cgc gac agc ggc ttc cgg gtc cgg atc ttc	1104
Gly Val Val Ala Ala Leu Arg Asp Ser Gly Phe Arg Val Arg Ile Phe	
355 360 365	
gac ccg ctg gcc gat ccc gcc gag atc gtc gcc cgg ttc ggc acc gcg	1152
Asp Pro Leu Ala Asp Pro Ala Glu Ile Val Ala Arg Phe Gly Thr Ala	
370 375 380	
ccg gcg gcg agc ctg gac gag gcg gtg agc ggg gcg ggc tgc ctg gcc	1200
Pro Ala Ala Ser Leu Asp Glu Ala Val Ser Gly Ala Gly Cys Leu Ala	
385 390 395 400	
ttc ctc gcc ggg cac cgc cag ttc cac gag ctc gac ttc ggc gcc ctg	1248
Phe Leu Ala Gly His Arg Gln Phe His Glu Leu Asp Phe Gly Ala Leu	
405 410 415	
gcc gag cgg gtg gac gag ccc tgc ctg gtc ttc gac ggc cgc atg cac	1296
Ala Glu Arg Val Asp Glu Pro Cys Leu Val Phe Asp Gly Arg Met His	
420 425 430	
ctc ccg ccg gcg cgc atc cgc gag ctg cac cgg ttc ggc ttc gcc tac	1344
Leu Pro Pro Ala Arg Ile Arg Glu Leu His Arg Phe Gly Phe Ala Tyr	
435 440 445	
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Arg Gly Ile Gly Arg *	
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 <213> Bacteria

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 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
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 Arg Arg His Leu Ser Glu Pro Leu Gln Leu Ala Asp Leu Ala Arg Val
 20 25 30

gtc ccc ttc agc ccg ttc cac ttc cac cgg ctg ttc cgc gac gtg acc 144
 Val Pro Phe Ser Pro Phe His Phe His Arg Leu Phe Arg Asp Val Thr
 35 40 45

acg atg acc ccg gcc cgc ttc ctc gcc gcg ctg cgg atg gcg gag gcc 192
 Thr Met Thr Pro Ala Arg Phe Leu Ala Ala Leu Arg Met Ala Glu Ala
 50 55 60

cgc cgg atg ctg ctg cac tcc ggc ctg acg gtg acc gcg atc agc ggc 240
 Arg Arg Met Leu Leu His Ser Gly Leu Thr Val Thr Ala Ile Ser Gly
 65 70 75 80

cac gtc ggc tac acg agc gcg ggg acc ttc acc acc cag ttc tcc cgg 288
 His Val Gly Tyr Thr Ser Ala Gly Thr Phe Thr Thr Gln Phe Ser Arg
 85 90 95

ctg gtc ggc acg tcg ccg ggg cac ttc cgg cag atg tcc cgg ctg ctg 336
 Leu Val Gly Thr Ser Pro Gly His Phe Arg Gln Met Ser Arg Leu Leu
 100 105 110

gcc ggc cgg ccc tgc cac gtc ctg gcg ggc tgg ctg cgc aac gcc gtc 384
 Ala Gly Arg Pro Cys His Val Leu Ala Gly Trp Leu Arg Asn Ala Val
 115 120 125

acg gag gtc acc cga ccc cgg ctg gtg ctg cac gtg ccc gag agc gag 432
 Thr Glu Val Thr Arg Pro Arg Leu Val Leu His Val Pro Glu Ser Glu
 130 135 140

ccc ggc gac ctg gtg ctg gtc ggc ctg cgg gcc gac ggg gag gcc gcg 480
 Pro Gly Asp Leu Val Leu Val Gly Leu Arg Ala Asp Gly Glu Ala Ala
 145 150 155 160

gac gcg tcg acc acg tgg gcg gtg gcg gcc gac ggc gcg cag gtc ccg 528
 Asp Ala Ser Thr Thr Trp Ala Val Ala Ala Asp Gly Ala Gln Val Pro
 165 170 175

gtg gtg gcg cgg ccg ggc ccg tac cag gcc cgg gtc gtg ctg gtc cgg 576
 Val Val Ala Arg Pro Gly Pro Tyr Gln Ala Arg Val Val Leu Val Arg
 180 185 190

ggc gac agc acg ctg acc cgc gcc ctg gtg gac gag gag ccc acc agc 624
 Gly Asp Ser Thr Leu Thr Arg Ala Leu Val Asp Glu Glu Pro Thr Ser
 195 200 205

 cat ctg gtc ggc acc gcc gaa ctg gtg ctg ccc cag gac ggc tgc gcg 672
 His Leu Val Gly Thr Ala Glu Leu Val Leu Pro Gln Asp Gly Cys Ala
 210 215 220

 gcc gtc ccg gtc acc acc gcg ccg ccg cgg ccg acc gac ccg ccg gcg 720
 Ala Val Pro Val Thr Thr Ala Pro Pro Arg Pro Thr Asp Pro Pro Ala
 225 230 235 240

 ctg gcc ctc ggc ccg gtg tgc cgg ctc gtc gag acg ttc acg cgg ctg 768
 Leu Ala Leu Gly Pro Val Cys Arg Leu Val Glu Thr Phe Thr Arg Leu
 245 250 255

 gcc ggc ccg tcg ggc cgg ccg ggt ccg gcc tgg tcg gcc ggc cgc acc 816
 Ala Gly Pro Ser Gly Arg Pro Gly Pro Ala Trp Ser Ala Gly Arg Thr
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 gcg ctg gcc gcg gcg gcc atc gcg tga 843
 Ala Leu Ala Ala Ala Ala Ile Ala *
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<210> 34
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 Val Pro Phe Ser Pro Phe His Phe His Arg Leu Phe Arg Asp Val Thr
 35 40 45
 Thr Met Thr Pro Ala Arg Phe Leu Ala Ala Leu Arg Met Ala Glu Ala
 50 55 60
 Arg Arg Met Leu Leu His Ser Gly Leu Thr Val Thr Ala Ile Ser Gly
 65 70 75 80
 His Val Gly Tyr Thr Ser Ala Gly Thr Phe Thr Thr Gln Phe Ser Arg
 85 90 95
 Leu Val Gly Thr Ser Pro Gly His Phe Arg Gln Met Ser Arg Leu Leu
 100 105 110
 Ala Gly Arg Pro Cys His Val Leu Ala Gly Trp Leu Arg Asn Ala Val
 115 120 125
 Thr Glu Val Thr Arg Pro Arg Leu Val Leu His Val Pro Glu Ser Glu
 130 135 140
 Pro Gly Asp Leu Val Leu Val Gly Leu Arg Ala Asp Gly Glu Ala Ala
 145 150 155 160
 Asp Ala Ser Thr Thr Trp Ala Val Ala Ala Asp Gly Ala Gln Val Pro
 165 170 175
 Val Val Ala Arg Pro Gly Pro Tyr Gln Ala Arg Val Val Leu Val Arg
 180 185 190

cgg ggc gcg atg gac gtg gtc gac gag ctg gcg tac ccg ctg gcg ctg	432
Arg Gly Ala Met Asp Val Val Asp Glu Leu Ala Tyr Pro Leu Ala Leu	
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cgc gcg gtc ctc ggc ctg ctc ggc ctg ccc gcc gcc gac tgg ggg gcg	480
Arg Ala Val Leu Gly Leu Leu Gly Leu Pro Ala Ala Asp Trp Gly Ala	
145 150 155 160	
gtc ggg cgc tgg tgc cgc gac gtg gga cgg acc ctg gac cgg ggc gcc	528
Val Gly Arg Trp Ser Arg Asp Val Gly Arg Thr Leu Asp Arg Gly Ala	
165 170 175	
agc gcc gag gac atg cgc cgc ggc cac gcg gcg atc gcc gag ttc gcc	576
Ser Ala Glu Asp Met Arg Arg Gly His Ala Ala Ile Ala Glu Phe Ala	
180 185 190	
gac tac gtg gag cgg gcc ctc gcg agg cgg cgg cgt gag ggc ggc gag	624
Asp Tyr Val Glu Arg Ala Leu Ala Arg Arg Arg Arg Glu Gly Gly Glu	
195 200 205	
gac ctg ctg gcg ttg atg ctc gac gcc cac gac cgc ggc ctg atg agt	672
Asp Leu Leu Ala Leu Met Leu Asp Ala His Asp Arg Gly Leu Met Ser	
210 215 220	
cgc aac gag atc gtc agc acg gtg gtc acg ttc atc ttc acc ggc cac	720
Arg Asn Glu Ile Val Ser Thr Val Val Thr Phe Ile Phe Thr Gly His	
225 230 235 240	
gag acg gtg gcc agc cag gtg ggc aac gcc gtg ctg agc ctg ctg gcg	768
Glu Thr Val Ala Ser Gln Val Gly Asn Ala Val Leu Ser Leu Leu Ala	
245 250 255	
cac ccg gac cag ctc gac ctg ctc cgg cgc cgg ccg gac ctg ctg gcc	816
His Pro Asp Gln Leu Asp Leu Leu Arg Arg Arg Pro Asp Leu Leu Ala	
260 265 270	
cag gcc gtc gag gag tgc ctg cgg tac gac ccg tgc gtg cag tcc aac	864
Gln Ala Val Glu Glu Cys Leu Arg Tyr Asp Pro Ser Val Gln Ser Asn	
275 280 285	
acc cgg cag ctc gac gtc gac gtg gag ctg cgc ggt cgg cgg ctg cgc	912
Thr Arg Gln Leu Asp Val Asp Val Glu Leu Arg Gly Arg Arg Leu Arg	
290 295 300	
cgc gac gac gtc gtg gtc gtc ctg gcc ggc gcg gcg aac cgg gac ccg	960
Arg Asp Asp Val Val Val Val Leu Ala Gly Ala Ala Asn Arg Asp Pro	
305 310 315 320	
cgg cgg tac gac cgg ccc gac gat ttc gac atc gag cgg gat ccg gtc	1008
Arg Arg Tyr Asp Arg Pro Asp Asp Phe Asp Ile Glu Arg Asp Pro Val	
325 330 335	
ccg tgc atg tcc ttc ggc gcg ggg atg cgc tac tgc ctc ggg tcc tac	1056
Pro Ser Met Ser Phe Gly Ala Gly Met Arg Tyr Cys Leu Gly Ser Tyr	
340 345 350	

ctc gcc cgt acg cag ctg cgc gcc gcg gtg gcc gcc ctg gcc cga ctg 1104
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 355 360 365

ccg ggc ctg cgg ctg ggc tgc gcg tgc gac gcc ctg gcc tat cag ccg 1152
 Pro Gly Leu Arg Leu Gly Cys Ala Ser Asp Ala Leu Ala Tyr Gln Pro
 370 375 380

cgc acc atg ttc cgg ggc ctg gcc agc ctg ccg atc gcg ttc acg ccg 1200
 Arg Thr Met Phe Arg Gly Leu Ala Ser Leu Pro Ile Ala Phe Thr Pro
 385 390 395 400

ggc ggt tga 1209
 Gly Gly *

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 <212> PRT
 <213> Bacteria

<400> 36
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 35 40 45
 Val Arg Ala Val Leu Gly Asp Glu Arg Phe Ala Arg Thr Gly Ile Arg
 50 55 60
 Arg Phe Trp Thr Asp Leu Val Gly Pro Gly Leu Leu Ala Glu Ile Val
 65 70 75 80
 Gly Asp Ile Ile Leu Phe Gln Asp Glu Pro Asp His Gly Arg Leu Arg
 85 90 95
 Gly Val Val Gly Pro Ala Phe Ser Pro Ser Ala Leu Arg Arg Leu Glu
 100 105 110
 Pro Val Ile Ala Gly Thr Val Asp Leu Leu Arg Pro Ala Leu Ala
 115 120 125
 Arg Gly Ala Met Asp Val Val Asp Glu Leu Ala Tyr Pro Leu Ala Leu
 130 135 140
 Arg Ala Val Leu Gly Leu Leu Gly Leu Pro Ala Ala Asp Trp Gly Ala
 145 150 155 160
 Val Gly Arg Trp Ser Arg Asp Val Gly Arg Thr Leu Asp Arg Gly Ala
 165 170 175
 Ser Ala Glu Asp Met Arg Arg Gly His Ala Ala Ile Ala Glu Phe Ala
 180 185 190
 Asp Tyr Val Glu Arg Ala Leu Ala Arg Arg Arg Arg Glu Gly Gly Glu
 195 200 205
 Asp Leu Leu Ala Leu Met Leu Asp Ala His Asp Arg Gly Leu Met Ser
 210 215 220
 Arg Asn Glu Ile Val Ser Thr Val Val Thr Phe Ile Phe Thr Gly His
 225 230 235 240
 Glu Thr Val Ala Ser Gln Val Gly Asn Ala Val Leu Ser Leu Leu Ala
 245 250 255
 His Pro Asp Gln Leu Asp Leu Leu Arg Arg Arg Pro Asp Leu Leu Ala

Ile Arg Asp Ala Arg Phe Asp Tyr Ser Trp Gln Val Arg Arg Ala Glu	
100 105 110	
ttc gac gcg atg ctg ctg gac cgg gcg cgg gaa ctg ggc gtg gtg gtg	384
Phe Asp Ala Met Leu Leu Asp Arg Ala Arg Glu Leu Gly Val Val Val	
115 120 125	
gtc gag gga gcc acc gtc cgg ggg ccg ctg acc gac ggc gag cgg gtc	432
Val Glu Gly Ala Thr Val Arg Gly Pro Leu Thr Asp Gly Glu Arg Val	
130 135 140	
gcg ggc gtc agc tac cag ttc cgg ggt gag gcc gac ccg atc gac gcc	480
Ala Gly Val Ser Tyr Gln Phe Arg Gly Glu Ala Asp Pro Ile Asp Ala	
145 150 155 160	
cgc gcc gcg atc gtg gtc gac gcg tcg ggg cag cag cgc tgg ctc ggc	528
Arg Ala Ala Ile Val Val Asp Ala Ser Gly Gln Gln Arg Trp Leu Gly	
165 170 175	
cgg cac ttc ggg ttg gtc tcc tgg cac gac gac ctg cgc aac atg gcg	576
Arg His Phe Gly Leu Val Ser Trp His Asp Asp Leu Arg Asn Met Ala	
180 185 190	
gcg tgg agc tac tac gcc ggg gcg ctg cgc tac ccc ggc gat cac gag	624
Ala Trp Ser Tyr Tyr Ala Gly Ala Leu Arg Tyr Pro Gly Asp His Glu	
195 200 205	
ggc gac ctg ctc gtc gag agc tgc gcc cag ggt tgg ctc tgg tac gcg	672
Gly Asp Leu Leu Val Glu Ser Cys Ala Gln Gly Trp Leu Trp Tyr Ala	
210 215 220	
ccg ctg agc ccc acc ctg acc ggg atc ggg tac gtc acc ccg tcg gac	720
Pro Leu Ser Pro Thr Leu Thr Gly Ile Gly Tyr Val Thr Pro Ser Asp	
225 230 235 240	
cgg ttc gcc gag acc ggc ctt ccc ccg gat cag ttg ctg gag aaa cag	768
Arg Phe Ala Glu Thr Gly Leu Pro Pro Asp Gln Leu Leu Glu Lys Gln	
245 250 255	
atc gcg gag tcg aac gag gtc tcc tgg ctc acc gcc ggc gcg cgg cgg	816
Ile Ala Glu Ser Asn Glu Val Ser Trp Leu Thr Ala Gly Ala Arg Arg	
260 265 270	
gtc gac gtc tac cgc acc gcg cgg gac tgg tcg tac gcg tgc agc cag	864
Val Asp Val Tyr Arg Thr Ala Arg Asp Trp Ser Tyr Ala Cys Ser Gln	
275 280 285	
ttc tcc ggg ccg ggc tgg gtg ctg gtc ggt gac gcc gcc gcc ttc atc	912
Phe Ser Gly Pro Gly Trp Val Leu Val Gly Asp Ala Ala Ala Phe Ile	
290 295 300	
gac ccc ctg ctg tcc tcc ggc gtg acg ctg gcg atg cgc ggc gcg ctc	960
Asp Pro Leu Leu Ser Ser Gly Val Thr Leu Ala Met Arg Gly Ala Leu	
305 310 315 320	
agc ctg tcc ccg gcg gtg cac gag gca ctg gcc gcg ccg gag aag gag	1008

Ser Leu Ser Arg Ala Val His Glu Ala Leu Ala Ala Pro Glu Lys Glu
 325 330 335
 cgc cat ctc atg cag gtg tac gag gac cgc tac cgg gac ttc ctc gcc 1056
 Arg His Leu Met Gln Val Tyr Glu Asp Arg Tyr Arg Asp Phe Leu Ala
 340 345 350
 gcc ctg ctg gat ctg atc cgg ttc ttc tac gac ggc gcg cac ggc cgc 1104
 Ala Leu Leu Asp Leu Ile Arg Phe Phe Tyr Asp Gly Ala His Gly Arg
 355 360 365
 gac gag ttg cac ctg cgc gcc cag gcc atc gtg gac ccg gac cgg ctg 1152
 Asp Glu Leu His Leu Arg Ala Gln Ala Ile Val Asp Pro Asp Arg Leu
 370 375 380
 atg cct ccg aag atc tcg ttc gtc tcc ctg ctg tcg ggg ctg gcg cgg 1200
 Met Pro Pro Lys Ile Ser Phe Val Ser Leu Leu Ser Gly Leu Ala Arg
 385 390 395 400
 ggc gac gag acg ctc gac cgc agc cct cgg acg gcc att gac cga ccg 1248
 Gly Asp Glu Thr Leu Asp Arg Ser Pro Arg Thr Ala Ile Asp Arg Pro
 405 410 415
 tca gac gct ata taa 1263
 Ser Asp Ala Ile *
 420

<210> 38
 <211> 420
 <212> PRT
 <213> Bacteria

<400> 38
 Met Ser His Pro Glu Pro Glu Tyr Asp Val Ile Val Val Gly Gly Gly
 1 5 10 15
 Pro Ala Gly Ser Ser Thr Ala Gly Leu Leu Ala Gln Glu Gly His Arg
 20 25 30
 Val Leu Leu Leu Glu Arg Glu Lys Phe Pro Arg Tyr His Ile Gly Glu
 35 40 45
 Ser Leu Ile Ser Gly Val Thr Leu Thr Leu Asp Ala Leu Gly Val Arg
 50 55 60
 Glu Arg Met Ala Glu Leu Arg Phe Gln Ile Lys His Gly Gly Ser Leu
 65 70 75 80
 Leu Trp Gly Ala Asp Gln Thr Ala Pro Trp Ser Phe Arg Phe Arg Glu
 85 90 95
 Ile Arg Asp Ala Arg Phe Asp Tyr Ser Trp Gln Val Arg Arg Ala Glu
 100 105 110
 Phe Asp Ala Met Leu Leu Asp Arg Ala Arg Glu Leu Gly Val Val Val
 115 120 125
 Val Glu Gly Ala Thr Val Arg Gly Pro Leu Thr Asp Gly Glu Arg Val
 130 135 140
 Ala Gly Val Ser Tyr Gln Phe Arg Gly Glu Ala Asp Pro Ile Asp Ala
 145 150 155 160
 Arg Ala Ala Ile Val Val Asp Ala Ser Gly Gln Gln Arg Trp Leu Gly
 165 170 175

Arg His Phe Gly Leu Val Ser Trp His Asp Asp Leu Arg Asn Met Ala
 180 185 190
 Ala Trp Ser Tyr Tyr Ala Gly Ala Leu Arg Tyr Pro Gly Asp His Glu
 195 200 205
 Gly Asp Leu Leu Val Glu Ser Cys Ala Gln Gly Trp Leu Trp Tyr Ala
 210 215 220
 Pro Leu Ser Pro Thr Leu Thr Gly Ile Gly Tyr Val Thr Pro Ser Asp
 225 230 235 240
 Arg Phe Ala Glu Thr Gly Leu Pro Pro Asp Gln Leu Leu Glu Lys Gln
 245 250 255
 Ile Ala Glu Ser Asn Glu Val Ser Trp Leu Thr Ala Gly Ala Arg Arg
 260 265 270
 Val Asp Val Tyr Arg Thr Ala Arg Asp Trp Ser Tyr Ala Cys Ser Gln
 275 280 285
 Phe Ser Gly Pro Gly Trp Val Leu Val Gly Asp Ala Ala Ala Phe Ile
 290 295 300
 Asp Pro Leu Leu Ser Ser Gly Val Thr Leu Ala Met Arg Gly Ala Leu
 305 310 315 320
 Ser Leu Ser Arg Ala Val His Glu Ala Leu Ala Ala Pro Glu Lys Glu
 325 330 335
 Arg His Leu Met Gln Val Tyr Glu Asp Arg Tyr Arg Asp Phe Leu Ala
 340 345 350
 Ala Leu Leu Asp Leu Ile Arg Phe Phe Tyr Asp Gly Ala His Gly Arg
 355 360 365
 Asp Glu Leu His Leu Arg Ala Gln Ala Ile Val Asp Pro Asp Arg Leu
 370 375 380
 Met Pro Pro Lys Ile Ser Phe Val Ser Leu Leu Ser Gly Leu Ala Arg
 385 390 395 400
 Gly Asp Glu Thr Leu Asp Arg Ser Pro Arg Thr Ala Ile Asp Arg Pro
 405 410 415
 Ser Asp Ala Ile
 420

<210> 39
 <211> 1137
 <212> DNA
 <213> B

<220>
 <221> CDS
 <222> (1)...(1137)

<400> 39
 atg cgc gtg ctg ttc gtc tcc tcc ccc ggt atc ggc cac ctc ttc ccg 48
 Met Arg Val Leu Phe Val Ser Ser Pro Gly Ile Gly His Leu Phe Pro
 1 5 10 15

 ctg atc cag ctc gcc tgg ggc ttc cgc acg gcc ggc cac gac gtg ctg 96
 Leu Ile Gln Leu Ala Trp Gly Phe Arg Thr Ala Gly His Asp Val Leu
 20 25 30

 atc gcg gtc gcc gag cac gcc gac cgg gcc gcc gcc gcg ggc ctg gag 144
 Ile Ala Val Ala Glu His Ala Asp Arg Ala Ala Ala Gly Leu Glu
 35 40 45

gtc gtc gac gtg gcg ccc gac tac agc gcg gtc aag gtc ttc gag cag	192
Val Val Asp Val Ala Pro Asp Tyr Ser Ala Val Lys Val Phe Glu Gln	
50 55 60	
gtg gcc aag gac aac ccg cgc ttc gcc gag acc gtc gcc acg cgt ccc	240
Val Ala Lys Asp Asn Pro Arg Phe Ala Glu Thr Val Ala Thr Arg Pro	
65 70 75 80	
gcg atc gat ctg gag gag tgg ggc gtg cag atc gcg gcg gtg aac cgc	288
Ala Ile Asp Leu Glu Glu Trp Gly Val Gln Ile Ala Ala Val Asn Arg	
85 90 95	
ccg ctg gtc gac ggg acc atg gcg ctg gtc gac gac tac cgt ccc gac	336
Pro Leu Val Asp Gly Thr Met Ala Leu Val Asp Asp Tyr Arg Pro Asp	
100 105 110	
ctg gtg gtc tac gag cag ggc gcc acc gtc ggc ctg ctg gcc gcc gac	384
Leu Val Val Tyr Glu Gln Gly Ala Thr Val Gly Leu Leu Ala Ala Asp	
115 120 125	
cgc gcc ggg gtg ccg gca gtg cag cgc aac cag agc gcc tgg cgg acc	432
Arg Ala Gly Val Pro Ala Val Gln Arg Asn Gln Ser Ala Trp Arg Thr	
130 135 140	
cgg ggc atg cac cgc tcg atc gcg tcc ttc ctg acc gac ctg atg gac	480
Arg Gly Met His Arg Ser Ile Ala Ser Phe Leu Thr Asp Leu Met Asp	
145 150 155 160	
aag cac cag gtc agc ctg ccc gag ccg gtg gcg acg atc gag tcg ttc	528
Lys His Gln Val Ser Leu Pro Glu Pro Val Ala Thr Ile Glu Ser Phe	
165 170 175	
ccg ccg agc ctg ctg ctg gag gcg gag ccc gag ggc tgg ttc atg cgc	576
Pro Pro Ser Leu Leu Leu Glu Ala Glu Pro Glu Gly Trp Phe Met Arg	
180 185 190	
tgg gtg ccg tac ggc ggc ggc gcc gtc ctc ggc gac cgg ctg ccg ccg	624
Trp Val Pro Tyr Gly Gly Gly Ala Val Leu Gly Asp Arg Leu Pro Pro	
195 200 205	
gtg ccc gcc cgg ccc gag gtg gcg atc acc atg ggc acc atc gag ctc	672
Val Pro Ala Arg Pro Glu Val Ala Ile Thr Met Gly Thr Ile Glu Leu	
210 215 220	
cag gcg ttc ggc atc ggc gcc gtg gag ccc atc atc gcc gcc gcc ggc	720
Gln Ala Phe Gly Ile Gly Ala Val Glu Pro Ile Ile Ala Ala Ala Gly	
225 230 235 240	
gag gtg gac gcc gac ttc gtg ctc gcc ctc ggc gac ctc gac atc agc	768
Glu Val Asp Ala Asp Phe Val Leu Ala Leu Gly Asp Leu Asp Ile Ser	
245 250 255	
ccg ctg ggc acg ttg ccg cgc aac gtc cgg gcg gtc ggc tgg acg ccg	816
Pro Leu Gly Thr Leu Pro Arg Asn Val Arg Ala Val Gly Trp Thr Pro	
260 265 270	

ctg cac acc ctg ctg cgt acc tgc acc gcg gtg gtg cac cac ggc ggg 864
 Leu His Thr Leu Leu Arg Thr Cys Thr Ala Val Val His His Gly Gly
 275 280 285
 ggc ggc acg gtg atg acc gcc atc gac gcc ggc atc ccg cag ctg ctc 912
 Gly Gly Thr Val Met Thr Ala Ile Asp Ala Gly Ile Pro Gln Leu Leu
 290 295 300
 gcc ccg gac ccg cgc gac cag ttc cag cac acc gcc cgg gag gcc gtc 960
 Ala Pro Asp Pro Arg Asp Gln Phe Gln His Thr Ala Arg Glu Ala Val
 305 310 315 320
 agc cgg cgc ggc atc ggc ctg gtc agc acg tcg gac aag gtc gac gcg 1008
 Ser Arg Arg Gly Ile Gly Leu Val Ser Thr Ser Asp Lys Val Asp Ala
 325 330 335
 gac ctg ctg cgc cgg ctg atc ggg gac gag tcg ctg cgc acc gcg gcc 1056
 Asp Leu Leu Arg Arg Leu Ile Gly Asp Glu Ser Leu Arg Thr Ala Ala
 340 345 350
 cgg gag gta cgc gag gag atg gtc gcg ctg ccc acg ccg gcg gag acg 1104
 Arg Glu Val Arg Glu Glu Met Val Ala Leu Pro Thr Pro Ala Glu Thr
 355 360 365
 gtg cgg cgc atc gtc gag cgc atc tcg ggt tga 1137
 Val Arg Arg Ile Val Glu Arg Ile Ser Gly *
 370 375

<210> 40
 <211> 378
 <212> PRT
 <213> Bacteria

<400> 40
 Met Arg Val Leu Phe Val Ser Ser Pro Gly Ile Gly His Leu Phe Pro
 1 5 10 15
 Leu Ile Gln Leu Ala Trp Gly Phe Arg Thr Ala Gly His Asp Val Leu
 20 25 30
 Ile Ala Val Ala Glu His Ala Asp Arg Ala Ala Ala Gly Leu Glu
 35 40 45
 Val Val Asp Val Ala Pro Asp Tyr Ser Ala Val Lys Val Phe Glu Gln
 50 55 60
 Val Ala Lys Asp Asn Pro Arg Phe Ala Glu Thr Val Ala Thr Arg Pro
 65 70 75 80
 Ala Ile Asp Leu Glu Glu Trp Gly Val Gln Ile Ala Ala Val Asn Arg
 85 90 95
 Pro Leu Val Asp Gly Thr Met Ala Leu Val Asp Asp Tyr Arg Pro Asp
 100 105 110
 Leu Val Val Tyr Glu Gln Gly Ala Thr Val Gly Leu Leu Ala Ala Asp
 115 120 125
 Arg Ala Gly Val Pro Ala Val Gln Arg Asn Gln Ser Ala Trp Arg Thr
 130 135 140
 Arg Gly Met His Arg Ser Ile Ala Ser Phe Leu Thr Asp Leu Met Asp
 145 150 155 160
 Lys His Gln Val Ser Leu Pro Glu Pro Val Ala Thr Ile Glu Ser Phe

Glu 65	Ser	Glu	Leu	Gly	Arg 70	Gly	Asp	Ile	Asp	Leu 75	Leu	Leu	Tyr	Ala	Ala 80	
gcc Ala	tgg Trp	cac His	cag Gln	ggc Gly 85	ccc Pro	gag Glu	ggc Gly	tgg Trp	ctg Leu 90	gcg Ala	cac His	tcc Ser	tac Tyr	atc Ile 95	cag Gln	288
cac His	tac Tyr	ctg Leu	ctc Leu 100	ggc Gly	ggg Gly	gtg Val	ccc Pro	cgg Arg 105	gcg Ala	acc Thr	gag Glu	atc Ile 110	cgg Arg	cag Gln	ggc Gly	336
tgc Cys	aac Asn 115	ggc Gly	atg Met	ttc Phe	acc Thr	atg Met	ctc Leu 120	gaa Glu	ctc Leu	gcg Ala	gcc Ala	agc Ser 125	tac Tyr	ctg Leu	aag Lys	384
gcc Ala 130	gcg Ala	ccg Pro	gaa Glu	cgc Arg	aag Lys	gcg Ala 135	gcg Ala	atg Met	ctc Leu	gtc Val	gcc Ala 140	gcc Ala	gac Asp	aac Asn	tac Tyr	432
ggc Gly 145	acc Thr	ccg Pro	ctg Leu	ctg Leu 150	gac Asp	cgc Arg	tgg Trp	cgc Arg	acc Thr	aac Asn 155	ctc Leu	ggc Gly	ttc Phe	atc Ile	ctc Leu 160	480
ggc Gly	gac Asp	gcc Ala	gcc Ala	tcc Ser 165	gcg Ala	gtg Val	gtg Val	ctg Leu 170	agc Ser	acc Thr	gag Glu	agc Ser	ggc Gly	ttc Phe 175	gtc Val	528
gag Glu	ctg Leu	atg Met	tcg Ser 180	gtc Val	tgc Cys	tcc Ser	atc Ile	acc Thr 185	gtg Val	ccg Pro	gag Glu	gcc Ala	gag Glu 190	gag Glu	gtg Val	576
cac His	cgc Arg	ggc Gly 195	ggc Gly	gag Glu	ccg Pro	atg Met	ttc Phe 200	ccg Pro	ccc Pro	ggc Gly	gcg Ala	acg Thr 205	ctc Leu	gcc Ala	aag Lys	624
gag Glu 210	ctc Leu	gac Asp	ttc Phe	ggc Gly	gcc Ala	cgg Arg 215	ctc Leu	ttc Phe	tac Tyr	cac His	atc Ile 220	acc Thr	gag Glu	cag Gln	acc Thr	672
ccc Pro 225	gtg Val	ctc Leu	gcc Ala	gtg Val	ctc Leu 230	ggc Gly	gag Glu	gcg Ala	cag Gln	gag Glu 235	acg Thr	atg Met	acc Thr	acc Thr	gtc Val 240	720
gcc Ala	gag Glu	cag Gln	gcg Ala	ctc Leu 245	gcc Ala	gag Glu	gcc Ala	ggc Gly	atc Ile 250	ggc Gly	acg Thr	gga Gly	gac Asp	ctg Leu 255	gcc Ala	768
aag Lys	gtc Val	tcc Ser	ttc Phe 260	atg Met	aac Asn	tac Tyr	tcc Ser	cgc Arg 265	gag Glu	gtg Val	gtc Val	gag Glu	cag Gln	cgc Arg	tgc Cys	816
atg Met	gcg Ala	ccc Pro	ctg Leu 275	ggg Gly	ctg Leu	ggg Gly	atg Met	gag Glu 280	aag Lys	tcc Ser	acc Thr	tgg Trp 285	gac Asp	ttc Phe	ggg Gly	864
cgg	atg	atc	ggg	cac	tgc	ggc	gcc	agc	gac	cac	ctg	ctc	gcc	ctg	cac	912

Arg Met Ile Gly His Cys Gly Ala Ser Asp His Leu Leu Ala Leu His
 290 295 300
 cac tcg ctg cgg gcc ggt gag gtc gcc gcc ggc gac cac gtg ctg tgg 960
 His Ser Leu Arg Ala Gly Glu Val Ala Ala Gly Asp His Val Leu Trp
 305 310 315 320
 ctg gcg atg ggc ccc ggc gtg gag ttc acc gcc gcc gtc ctg cgc gta 1008
 Leu Ala Met Gly Pro Gly Val Glu Phe Thr Ala Ala Val Leu Arg Val
 325 330 335
 ctg gac aac ccc tac gtc gag cgc tga 1035
 Leu Asp Asn Pro Tyr Val Glu Arg *
 340

<210> 42
 <211> 344
 <212> PRT
 <213> Bacteria

<400> 42
 Met Arg Thr Ala Gly Thr Tyr Ile Arg Gly Ile Gly Ala Tyr Leu Pro
 1 5 10 15
 Glu Thr Val Thr Val Glu Glu Ala Val Ala Gln Gly Leu Tyr Pro Gln
 20 25 30
 Glu Asp Ile Glu Thr His Gly Leu Gly Gly Ala Ala Ile Ala Gly Glu
 35 40 45
 Leu Pro Ala Pro Asp Met Ala Leu Arg Ala Ala Gln Asp Ala Leu Lys
 50 55 60
 Glu Ser Glu Leu Gly Arg Gly Asp Ile Asp Leu Leu Leu Tyr Ala Ala
 65 70 75 80
 Ala Trp His Gln Gly Pro Glu Gly Trp Leu Ala His Ser Tyr Ile Gln
 85 90 95
 His Tyr Leu Leu Gly Gly Val Pro Arg Ala Thr Glu Ile Arg Gln Gly
 100 105 110
 Cys Asn Gly Met Phe Thr Met Leu Glu Leu Ala Ala Ser Tyr Leu Lys
 115 120 125
 Ala Ala Pro Glu Arg Lys Ala Ala Met Leu Val Ala Ala Asp Asn Tyr
 130 135 140
 Gly Thr Pro Leu Leu Asp Arg Trp Arg Thr Asn Leu Gly Phe Ile Leu
 145 150 155 160
 Gly Asp Ala Ala Ser Ala Val Val Leu Ser Thr Glu Ser Gly Phe Val
 165 170 175
 Glu Leu Met Ser Val Cys Ser Ile Thr Val Pro Glu Ala Glu Glu Val
 180 185 190
 His Arg Gly Gly Glu Pro Met Phe Pro Pro Gly Ala Thr Leu Ala Lys
 195 200 205
 Glu Leu Asp Phe Gly Ala Arg Leu Phe Tyr His Ile Thr Glu Gln Thr
 210 215 220
 Pro Val Leu Ala Val Leu Gly Glu Ala Gln Glu Thr Met Thr Thr Val
 225 230 235 240
 Ala Glu Gln Ala Leu Ala Glu Ala Gly Ile Gly Thr Gly Asp Leu Ala
 245 250 255
 Lys Val Ser Phe Met Asn Tyr Ser Arg Glu Val Val Glu Gln Arg Cys
 260 265 270

Met Ala Pro Leu Gly Leu Gly Met Glu Lys Ser Thr Trp Asp Phe Gly
 275 280 285
 Arg Met Ile Gly His Cys Gly Ala Ser Asp His Leu Leu Ala Leu His
 290 295 300
 His Ser Leu Arg Ala Gly Glu Val Ala Ala Gly Asp His Val Leu Trp
 305 310 315 320
 Leu Ala Met Gly Pro Gly Val Glu Phe Thr Ala Ala Val Leu Arg Val
 325 330 335
 Leu Asp Asn Pro Tyr Val Glu Arg
 340

<210> 43
 <211> 1347
 <212> DNA
 <213> .

<220>
 <221> CDS
 <222> (1)...(1347)

<400> 43
 gtg acc ggg cgc gac gac cgg ccc gac ggc gct cgg ccg gtc cca ccc 48
 Val Thr Gly Arg Asp Asp Arg Pro Asp Gly Ala Arg Pro Val Pro Pro
 1 5 10 15
 ggg cca gcg gtc acg ccc ggg cca gcg gtc acg ccc ggg ccg ccg gtc 96
 Gly Pro Ala Val Thr Pro Gly Pro Ala Val Thr Pro Gly Pro Pro Val
 20 25 30
 acg cca ggg cgg gcg gcg gac gga ccg gcc gag gcc ggg agc gcg gcc 144
 Thr Pro Gly Arg Ala Ala Asp Gly Pro Ala Glu Ala Gly Ser Ala Ala
 35 40 45
 ggg atc gac gcg ttt ccg ctg ccc cgc cgg tgc ccg ttc ggc ccg ccg 192
 Gly Ile Asp Ala Phe Pro Leu Pro Arg Arg Cys Pro Phe Gly Pro Pro
 50 55 60
 gcc gag tac gcc cgg ctg cgg acc gag cgg ccg gtc gcc cgg ctg ccc 240
 Ala Glu Tyr Ala Arg Leu Arg Thr Glu Arg Pro Val Ala Arg Leu Pro
 65 70 75 80
 atg ctc ggc ggc aac acg gcc tgg gtg gtg tcc cgg tac gcc gac gtc 288
 Met Leu Gly Gly Asn Thr Ala Trp Val Val Ser Arg Tyr Ala Asp Val
 85 90 95
 aag cgg gtg ctc agc gac ccg cgg atg agc gcg gac cgg cgc cgg gcc 336
 Lys Arg Val Leu Ser Asp Pro Arg Met Ser Ala Asp Arg Arg Arg Ala
 100 105 110
 ggt ttt ccg cgg ttc gcg ccg acc acc gag agc cag cgg cag gcc tcg 384
 Gly Phe Pro Arg Phe Ala Pro Thr Glu Ser Gln Arg Gln Ala Ser
 115 120 125
 ttc gcg aac ttc cgc ccc ccg ctg aac tgg atg gac ccg ccg gag cac 432
 Phe Ala Asn Phe Arg Pro Pro Leu Asn Trp Met Asp Pro Pro Glu His

130	135	140	
acc gcc gcc cgc cgc cag atc gtc gac gag ttc gcc gcg cgg cgg gta			480
Thr Ala Ala Arg Arg Gln Ile Val Asp Glu Phe Ala Ala Arg Arg Val			
145	150	155	160
cga cag ctg cgg ccg ctg gtc gag cgg gtg gtg gac gag cac ctc gac			528
Arg Gln Leu Arg Pro Leu Val Glu Arg Val Val Asp Glu His Leu Asp			
	165	170	175
gcc atg acg gcc ggg cgg tcg agc gcc gac ctg gtg ccg tcg ttc agc			576
Ala Met Thr Ala Gly Arg Ser Ser Ala Asp Leu Val Pro Ser Phe Ser			
	180	185	190
tat ccg gtg ccg tcg cgg gtg atc tgc gag atg ctc ggc gtg ccg tac			624
Tyr Pro Val Pro Ser Arg Val Ile Cys Glu Met Leu Gly Val Pro Tyr			
	195	200	205
ggc gaa cac gcg ttc ttc gag cgc cgg tcc acc cgg atg ctg agt cgc			672
Gly Glu His Ala Phe Phe Glu Arg Arg Ser Thr Arg Met Leu Ser Arg			
	210	215	220
ggc gtg ccc gcg gac gag cgg gcc cgg tgc gcc cgc gag atc cgc gag			720
Gly Val Pro Ala Asp Glu Arg Ala Arg Cys Ala Arg Glu Ile Arg Glu			
	225	230	235
ttc ctc gac ggc gtg gtg acc gac aag gag cgg cac ccc ggc gac gac			768
Phe Leu Asp Gly Val Val Thr Asp Lys Glu Arg His Pro Gly Asp Asp			
	245	250	255
gtg ctc agc cgg ctg ctc gcc gcg cag cgc gcg gcc ggc gag ccc gac			816
Val Leu Ser Arg Leu Leu Ala Ala Gln Arg Ala Ala Gly Glu Pro Asp			
	260	265	270
cac gag gcc gtg gtg agc atg gcc ttc gtg ctg ctg gtc gcc ggg cac			864
His Glu Ala Val Val Ser Met Ala Phe Val Leu Leu Val Ala Gly His			
	275	280	285
gtc acg acg tcg aac atg atc tcg ctg agc gtg ctg gcc ctg ttg acc			912
Val Thr Thr Ser Asn Met Ile Ser Leu Ser Val Leu Ala Leu Leu Thr			
	290	295	300
cat ccg gag cgg ctc gcc cgc ctg cgc gcc gag ccg gac cgg ttc ccc			960
His Pro Glu Arg Leu Ala Arg Leu Arg Ala Glu Pro Asp Arg Phe Pro			
	305	310	315
gcc gcc gtc gag gag ctg ctg cgg tac ttc acc atc gtc gag gcg gcg			1008
Ala Ala Val Glu Glu Leu Leu Arg Tyr Phe Thr Ile Val Glu Ala Ala			
	325	330	335
acc gcg cgg acc gcg acc gcc gac gtg acg gtc ggt ggg gtc acc atc			1056
Thr Ala Arg Thr Ala Thr Ala Asp Val Thr Val Gly Gly Val Thr Ile			
	340	345	350
cgg gcc ggg gag ggg gtg gtg gcg ctg ggc cag gcc gcc aac cgg gac			1104
Arg Ala Gly Glu Gly Val Val Ala Leu Gly Gln Ala Ala Asn Arg Asp			

355	360	365	
ccg gcg gcg ttc gac cgg ccg gac gag ttc gac ccg gac cgc gac gcc			1152
Pro Ala Ala Phe Asp Arg Pro Asp Glu Phe Asp Pro Asp Arg Asp Ala			
370	375	380	
cgg cac cac ctc gcc ttc ggc tac gga cga cac atc tgc ccc ggc cag			1200
Arg His His Leu Ala Phe Gly Tyr Gly Arg His Ile Cys Pro Gly Gln			
385	390	395	400
cac ctg gcc cgg ctg gaa ctg gac gtc gcg ctg agc cgg ctg gtc cgg			1248
His Leu Ala Arg Leu Glu Leu Asp Val Ala Leu Ser Arg Leu Val Arg			
	405	410	415
cgg ctg ccc ggg ctg cgg ttg acc gtg gac gtg gac gac ctg ccg ctc			1296
Arg Leu Pro Gly Leu Arg Leu Thr Val Asp Val Asp Asp Leu Pro Leu			
	420	425	430
aag gag gac ggc aac atc ttc ggc ctg cac gcg ctg ccg gtc gcc tgg			1344
Lys Glu Asp Gly Asn Ile Phe Gly Leu His Ala Leu Pro Val Ala Trp			
	435	440	445
tga			1347
*			

<210> 44
 <211> 448
 <212> PRT
 <213> Bacteria

<400> 44
 Val Thr Gly Arg Asp Asp Arg Pro Asp Gly Ala Arg Pro Val Pro Pro
 1 5 10 15
 Gly Pro Ala Val Thr Pro Gly Pro Ala Val Thr Pro Gly Pro Pro Val
 20 25 30
 Thr Pro Gly Arg Ala Ala Asp Gly Pro Ala Glu Ala Gly Ser Ala Ala
 35 40 45
 Gly Ile Asp Ala Phe Pro Leu Pro Arg Arg Cys Pro Phe Gly Pro Pro
 50 55 60
 Ala Glu Tyr Ala Arg Leu Arg Thr Glu Arg Pro Val Ala Arg Leu Pro
 65 70 75 80
 Met Leu Gly Gly Asn Thr Ala Trp Val Val Ser Arg Tyr Ala Asp Val
 85 90 95
 Lys Arg Val Leu Ser Asp Pro Arg Met Ser Ala Asp Arg Arg Arg Ala
 100 105 110
 Gly Phe Pro Arg Phe Ala Pro Thr Thr Glu Ser Gln Arg Gln Ala Ser
 115 120 125
 Phe Ala Asn Phe Arg Pro Pro Leu Asn Trp Met Asp Pro Pro Glu His
 130 135 140
 Thr Ala Ala Arg Arg Gln Ile Val Asp Glu Phe Ala Ala Arg Arg Val
 145 150 155 160
 Arg Gln Leu Arg Pro Leu Val Glu Arg Val Val Asp Glu His Leu Asp
 165 170 175
 Ala Met Thr Ala Gly Arg Ser Ser Ala Asp Leu Val Pro Ser Phe Ser

agt ggt gcc agc cgt tgc tgg cac cgt gcg gga cgg gtc tgg tgg cgt	192
Ser Gly Ala Ser Arg Cys Trp His Arg Ala Gly Arg Val Trp Trp Arg	
50 55 60	
tcg tcg tcc gac gca tcg acg gcg tgc tgc acg tgc tcg ccc acg ccg	240
Ser Ser Ser Asp Ala Ser Thr Ala Cys Cys Thr Cys Ser Pro Thr Pro	
65 70 75 80	
acc tgc ggc ccg gct acc ggg aca ccg tcg agc tgg gac cga ccg tgc	288
Thr Cys Gly Pro Ala Thr Gly Thr Pro Ser Ser Trp Asp Arg Pro Cys	
85 90 95	
agt gca ccc cgg gac aac ttc acc ggc ccg gcc cgg gac ggc cgc ccg	336
Ser Ala Pro Arg Asp Asn Phe Thr Gly Pro Ala Arg Asp Gly Arg Pro	
100 105 110	
gcg tac ctc gac ctg gtg ctc tcc gac gag gtc cgc gtg cac tac gac	384
Ala Tyr Leu Asp Leu Val Leu Ser Asp Glu Val Arg Val His Tyr Asp	
115 120 125	
gtg ctg cag tcg gag gag ggc ggg cgg ttc cac cac gcg gtg acc ccg	432
Val Leu Gln Ser Glu Glu Gly Gly Arg Phe His His Ala Val Thr Arg	
130 135 140	
cac atg gtg gtg gag gtg ggc ccg gac ttc ccc acc gcg aca ccg ccg	480
His Met Val Val Glu Val Gly Pro Asp Phe Pro Thr Ala Thr Pro Pro	
145 150 155 160	
gac tac acc tgg ctg acc ctg cgc cag ttg acc gcc gtg gcg gcc ttc	528
Asp Tyr Thr Trp Leu Thr Leu Arg Gln Leu Thr Ala Val Ala Ala Phe	
165 170 175	
agc tat cag gtc aac atc gag gcg cgc agc ctc ctg ctc tgc ctg ccg	576
Ser Tyr Gln Val Asn Ile Glu Ala Arg Ser Leu Leu Leu Cys Leu Arg	
180 185 190	
gcg ctg cgg tga	588
Ala Leu Arg *	
195	

<210> 46
 <211> 195
 <212> PRT
 <213> Bacteria

<400> 46
Arg Pro His Pro Trp Arg Pro Gly Arg Ser Arg Cys Ala Arg Cys Ala
1 5 10 15
Thr Gly Thr Ala Pro Thr Thr Arg Ser Ala Thr Ala Pro Ala Gly Ser
20 25 30
Ser Ala Ser Ser Ala Gly Gly Cys Gly Pro Ala Thr Ala Arg Cys Pro
35 40 45
Ser Gly Ala Ser Arg Cys Trp His Arg Ala Gly Arg Val Trp Trp Arg
50 55 60

Ser Ser Ser Asp Ala Ser Thr Ala Cys Cys Thr Cys Ser Pro Thr Pro
 65 70 75 80
 Thr Cys Gly Pro Ala Thr Gly Thr Pro Ser Ser Trp Asp Arg Pro Cys
 85 90 95
 Ser Ala Pro Arg Asp Asn Phe Thr Gly Pro Ala Arg Asp Gly Arg Pro
 100 105 110
 Ala Tyr Leu Asp Leu Val Leu Ser Asp Glu Val Arg Val His Tyr Asp
 115 120 125
 Val Leu Gln Ser Glu Glu Gly Gly Arg Phe His His Ala Val Thr Arg
 130 135 140
 His Met Val Val Glu Val Gly Pro Asp Phe Pro Thr Ala Thr Pro Pro
 145 150 155 160
 Asp Tyr Thr Trp Leu Thr Leu Arg Gln Leu Thr Ala Val Ala Ala Phe
 165 170 175
 Ser Tyr Gln Val Asn Ile Glu Ala Arg Ser Leu Leu Leu Cys Leu Arg
 180 185 190
 Ala Leu Arg
 195

<210> 47
 <211> 591
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(591)

<400> 47
 atg acc cgg gac gat ccc gcc gac aac ccg tac cag gtg gcc gtc atc 48
 Met Thr Arg Asp Asp Pro Ala Asp Asn Pro Tyr Gln Val Ala Val Ile
 1 5 10 15
 ggc atc ggt tgc cgg ctg ccc agc gac gtc gac acc ccg gac gcc ctc 96
 Gly Ile Gly Cys Arg Leu Pro Ser Asp Val Asp Thr Pro Asp Ala Leu
 20 25 30
 tgg gag ctg cta ctc aag ggc ggc cag acc gcc ggc gag atc ccg gcg 144
 Trp Glu Leu Leu Leu Lys Gly Gly Gln Thr Ala Gly Glu Ile Pro Ala
 35 40 45
 cag cgc tgg cgc gcc tac cgg gag cgc ggc ccc gag tac gag gcg gtc 192
 Gln Arg Trp Arg Ala Tyr Arg Glu Arg Gly Pro Glu Tyr Glu Ala Val
 50 55 60
 ctg cgc gac acc gtc acc gcc ggc agc tac ctg cgt gac gtc gcg ggc 240
 Leu Arg Asp Thr Val Thr Ala Gly Ser Tyr Leu Arg Asp Val Ala Gly
 65 70 75 80
 ttc gac ccc gag ttc ttc ggc ctg tcg ccc cgg gag gcg gcc gag atg 288
 Phe Asp Pro Glu Phe Phe Gly Leu Ser Pro Arg Glu Ala Ala Glu Met
 85 90 95
 gac ccg cag cag cgg atc ctg ctc gag gtc ggc tgg gag gcc ctg gag 336
 Asp Pro Gln Gln Arg Ile Leu Leu Glu Val Gly Trp Glu Ala Leu Glu

	100	105	110	
cac gcc ggc ctg cca ccc acc cgg ctg gcc ggc acc gac acg ggc gtc				384
His Ala Gly Leu Pro Pro Thr Arg Leu Ala Gly Thr Asp Thr Gly Val				
	115	120	125	
ttc gtc ggg gac agc acc acc gac tac ggc gac cgg ctg ctg gag gac				432
Phe Val Gly Asp Ser Thr Thr Asp Tyr Gly Asp Arg Leu Leu Glu Asp				
	130	135	140	
ctg ccg acc gtc gag gcg tac acc ggg atc ggc gcg gcc acc tgc gcc				480
Leu Pro Thr Val Glu Ala Tyr Thr Gly Ile Gly Ala Ala Thr Cys Ala				
	145	150	155	160
ctg gcc aac cgc atc tcc tac gcg ctg gac ctg cac ggc ccg agc gtc				528
Leu Ala Asn Arg Ile Ser Tyr Ala Leu Asp Leu His Gly Pro Ser Val				
	165	170	175	
gcc gag gac acg gtc tgc tcg gcg tcg ctg gtc gcg gtg cac ctg gcc				576
Ala Glu Asp Thr Val Cys Ser Ala Ser Leu Val Ala Val His Leu Ala				
	180	185	190	
tgc cag agc ctg ctg				591
Cys Gln Ser Leu Leu				
	195			

<210> 48
 <211> 197
 <212> PRT
 <213> Bacteria

<400> 48

Met Thr Arg Asp Asp Pro Ala Asp Asn Pro Tyr Gln Val Ala Val Ile				
1	5	10	15	
Gly Ile Gly Cys Arg Leu Pro Ser Asp Val Asp Thr Pro Asp Ala Leu				
	20	25	30	
Trp Glu Leu Leu Leu Lys Gly Gly Gln Thr Ala Gly Glu Ile Pro Ala				
	35	40	45	
Gln Arg Trp Arg Ala Tyr Arg Glu Arg Gly Pro Glu Tyr Glu Ala Val				
	50	55	60	
Leu Arg Asp Thr Val Thr Ala Gly Ser Tyr Leu Arg Asp Val Ala Gly				
65	70	75	80	
Phe Asp Pro Glu Phe Phe Gly Leu Ser Pro Arg Glu Ala Ala Glu Met				
	85	90	95	
Asp Pro Gln Gln Arg Ile Leu Leu Glu Val Gly Trp Glu Ala Leu Glu				
	100	105	110	
His Ala Gly Leu Pro Pro Thr Arg Leu Ala Gly Thr Asp Thr Gly Val				
	115	120	125	
Phe Val Gly Asp Ser Thr Thr Asp Tyr Gly Asp Arg Leu Leu Glu Asp				
	130	135	140	
Leu Pro Thr Val Glu Ala Tyr Thr Gly Ile Gly Ala Ala Thr Cys Ala				
145	150	155	160	
Leu Ala Asn Arg Ile Ser Tyr Ala Leu Asp Leu His Gly Pro Ser Val				
	165	170	175	
Ala Glu Asp Thr Val Cys Ser Ala Ser Leu Val Ala Val His Leu Ala				

180
Cys Gln Ser Leu Leu
195

185

190

<210> 49
<211> 618
<212> DNA
<213> Bacteria

<220>
<221> CDS
<222> (1)...(618)

<400> 49

atc ccc gag gag gcc ggg cag ctc agc atc gcg ggg gtg gcc gag ttg	48
Ile Pro Glu Glu Ala Gly Gln Leu Ser Ile Ala Gly Val Ala Glu Leu	
1 5 10 15	
gtg gcc cgc cgc gcc gac ccg ccc gga cac acc gag aac agc gtg ctc	96
Val Ala Arg Arg Ala Asp Pro Pro Gly His Thr Glu Asn Ser Val Leu	
20 25 30	
atc gcc gcg ccg ctg ccg ctg gtc tgg gac gtc acc aac gac gtg gcc	144
Ile Ala Ala Pro Leu Pro Leu Val Trp Asp Val Thr Asn Asp Val Ala	
35 40 45	
ggc tgg ccc gag ctg ttc acc gag tac gcc cgg gcg gag atc ctg gac	192
Gly Trp Pro Glu Leu Phe Thr Glu Tyr Ala Arg Ala Glu Ile Leu Asp	
50 55 60	
ggc gac ggc gac acc gtg cgg ttc cgg ctc acc atg cac ccc gac gag	240
Gly Asp Gly Asp Thr Val Arg Phe Arg Leu Thr Met His Pro Asp Glu	
65 70 75 80	
aac ggg gtg gcg tgg agc tgg gtc agc gaa cgc acg gcc gac ccg gcc	288
Asn Gly Val Ala Trp Ser Trp Val Ser Glu Arg Thr Ala Asp Pro Ala	
85 90 95	
acc cgg cag gtg cgc gcc cgg cgg gtg gag acc ggg ccg ttc gag tac	336
Thr Arg Gln Val Arg Ala Arg Arg Val Glu Thr Gly Pro Phe Glu Tyr	
100 105 110	
atg cgc atc cac tgg cgc tac gcg gag gag ccc ggc ggc acg cgg atg	384
Met Arg Ile His Trp Arg Tyr Ala Glu Glu Pro Gly Gly Thr Arg Met	
115 120 125	
acg tgg gtg cag gac ttc gcg atg aag ccg acc gcg ccg gtg gac aac	432
Thr Trp Val Gln Asp Phe Ala Met Lys Pro Thr Ala Pro Val Asp Asn	
130 135 140	
gcc ggc atg acc gac ccg atc aac gcc aac agc gcc gtg cag ctc gcc	480
Ala Gly Met Thr Asp Arg Ile Asn Ala Asn Ser Ala Val Gln Leu Ala	
145 150 155 160	
gtc atc cgg gac aag atc gaa cgc ctg gcc cgc gag gga acg gct ggc	528

Val Ile Arg Asp Lys Ile Glu Arg Leu Ala Arg Glu Gly Thr Ala Gly
165 170 175

ccg gcc ccc gcc gcc gcg gcc gcc acc acg ccc ggc ccg gcc ccg gcc 576
Pro Ala Pro Ala Ala Ala Ala Thr Thr Pro Gly Pro Ala Pro Ala
180 185 190

gcg cgc acc gcc gac gag gcg acg gga gcc ggc gat gag tga 618
Ala Arg Thr Ala Asp Glu Ala Thr Gly Ala Gly Asp Glu *
195 200 205

<210> 50
<211> 205
<212> PRT
<213> Bacteria

<400> 50
Ile Pro Glu Glu Ala Gly Gln Leu Ser Ile Ala Gly Val Ala Glu Leu
1 5 10 15
Val Ala Arg Arg Ala Asp Pro Pro Gly His Thr Glu Asn Ser Val Leu
20 25 30
Ile Ala Ala Pro Leu Pro Leu Val Trp Asp Val Thr Asn Asp Val Ala
35 40 45
Gly Trp Pro Glu Leu Phe Thr Glu Tyr Ala Arg Ala Glu Ile Leu Asp
50 55 60
Gly Asp Gly Asp Thr Val Arg Phe Arg Leu Thr Met His Pro Asp Glu
65 70 75 80
Asn Gly Val Ala Trp Ser Trp Val Ser Glu Arg Thr Ala Asp Pro Ala
85 90 95
Thr Arg Gln Val Arg Ala Arg Arg Val Glu Thr Gly Pro Phe Glu Tyr
100 105 110
Met Arg Ile His Trp Arg Tyr Ala Glu Glu Pro Gly Gly Thr Arg Met
115 120 125
Thr Trp Val Gln Asp Phe Ala Met Lys Pro Thr Ala Pro Val Asp Asn
130 135 140
Ala Gly Met Thr Asp Arg Ile Asn Ala Asn Ser Ala Val Gln Leu Ala
145 150 155 160
Val Ile Arg Asp Lys Ile Glu Arg Leu Ala Arg Glu Gly Thr Ala Gly
165 170 175
Pro Ala Pro Ala Ala Ala Ala Thr Thr Pro Gly Pro Ala Pro Ala
180 185 190
Ala Arg Thr Ala Asp Glu Ala Thr Gly Ala Gly Asp Glu
195 200 205

<210> 51
<211> 405
<212> DNA
<213> Bacteria

<220>
<221> CDS
<222> (1)...(405)

<400> 51
atg agt gac cag acc ctg cgg ctg gtc gcc gcc gcc gcc gtc gcg ccg 48
Met Ser Asp Gln Thr Leu Arg Leu Val Ala Ala Ala Val Ala Pro
1 5 10 15
gac agc cgc cgt ggc ggc gag ctg cgg gtg ctg ctc ggc ccg aag acc 96
Asp Ser Arg Arg Gly Gly Glu Leu Arg Val Leu Leu Gly Pro Lys Thr
20 25 30
gtc ggc agc acg tcc ggc ttc atg ggg gtg gcg acg ctg cgc ccg ggg 144
Val Gly Ser Thr Ser Gly Phe Met Gly Val Ala Thr Leu Arg Pro Gly
35 40 45
gag cgg atc gcc gag cac tac cat ccc tac agc gag gag ttc ctg tac 192
Glu Arg Ile Ala Glu His Tyr His Pro Tyr Ser Glu Glu Phe Leu Tyr
50 55 60
gtc gcc cgg ggc gcg atc acc gcc gac ctg gac gac gag ccg gtg ccg 240
Val Ala Arg Gly Ala Ile Thr Ala Asp Leu Asp Asp Glu Pro Val Pro
65 70 75 80
ctg gcc gcc ggg gag gcg ctg ttc gtg ccg cgc tac gtc cgg cac ccg 288
Leu Ala Ala Gly Glu Ala Leu Phe Val Pro Arg Tyr Val Arg His Arg
85 90 95
ctg cgc aac acc ggc gac gag ccg gcc gag gtg gtc ttc cac ctc ggt 336
Leu Arg Asn Thr Gly Asp Glu Pro Ala Glu Val Val Phe His Leu Gly
100 105 110
ccc ctc gcc ccc cgg ccc gaa ctc ggc cac gtc gac acc gag ctc gtc 384
Pro Leu Ala Pro Arg Pro Glu Leu Gly His Val Asp Thr Glu Leu Val
115 120 125
gag caa cgg ggc ggg tcg tga 405
Glu Gln Arg Gly Gly Ser *
130

<210> 52
<211> 134
<212> PRT
<213> Bacteria

<400> 52
Met Ser Asp Gln Thr Leu Arg Leu Val Ala Ala Ala Ala Val Ala Pro
1 5 10 15
Asp Ser Arg Arg Gly Gly Glu Leu Arg Val Leu Leu Gly Pro Lys Thr
20 25 30
Val Gly Ser Thr Ser Gly Phe Met Gly Val Ala Thr Leu Arg Pro Gly
35 40 45
Glu Arg Ile Ala Glu His Tyr His Pro Tyr Ser Glu Glu Phe Leu Tyr
50 55 60
Val Ala Arg Gly Ala Ile Thr Ala Asp Leu Asp Asp Glu Pro Val Pro
65 70 75 80
Leu Ala Ala Gly Glu Ala Leu Phe Val Pro Arg Tyr Val Arg His Arg
85 90 95

Leu Arg Asn Thr Gly Asp Glu Pro Ala Glu Val Val Phe His Leu Gly
 100 105 110
 Pro Leu Ala Pro Arg Pro Glu Leu Gly His Val Asp Thr Glu Leu Val
 115 120 125
 Glu Gln Arg Gly Gly Ser
 130

<210> 53
 <211> 1137
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(1137)

<400> 53
 gtg acc ggg cgc cgc acg gtg gtg acc ggc gtc ggg gtg gtc gcc ccc 48
 Val Thr Gly Arg Arg Thr Val Val Thr Gly Val Gly Val Val Ala Pro
 1 5 10 15

 ggc gcc gcc agc cgg gac cgg ttc tgg aag gcc atc acc gag ggg cgc 96
 Gly Gly Ala Ser Arg Asp Arg Phe Trp Lys Ala Ile Thr Glu Gly Arg
 20 25 30

 acc gcg acc cgc cgg atc acc ttc ttc gac ccg tcc gcg ttc cgg tcg 144
 Thr Ala Thr Arg Arg Ile Thr Phe Phe Asp Pro Ser Ala Phe Arg Ser
 35 40 45

 cag atc gcc gcc gag tgc gac ttc gac ccg gtc gcc gcc ggc ctc tcc 192
 Gln Ile Ala Ala Glu Cys Asp Phe Asp Pro Val Ala Ala Gly Leu Ser
 50 55 60

 gag gcc gag cgg cgg cgc gcc gac cgg tac gtg cag ttc gcg ctc gcc 240
 Glu Ala Glu Arg Arg Arg Ala Asp Arg Tyr Val Gln Phe Ala Leu Ala
 65 70 75 80

 tgc tcc gcc gag gcg gtc gcc gac gcc ggg ctg gag ctc acc gac gcc 288
 Cys Ser Ala Glu Ala Val Ala Asp Ala Gly Leu Glu Leu Thr Asp Ala
 85 90 95

 gag cgg gac cgc gcc ggg gtg gtg ctc ggc acc gcc gtc ggc ggc acc 336
 Glu Arg Asp Arg Ala Gly Val Val Leu Gly Thr Ala Val Gly Gly Thr
 100 105 110

 atg gcc ctg gag cag gag tac gtc acg gtc agc gac acc ggc cgc cgg 384
 Met Ala Leu Glu Gln Glu Tyr Val Thr Val Ser Asp Thr Gly Arg Arg
 115 120 125

 tgg ctg gtc gac gcc gcg cgc ggc ggc ccg tac ctc tac cag gcg ctg 432
 Trp Leu Val Asp Ala Ala Arg Gly Gly Pro Tyr Leu Tyr Gln Ala Leu
 130 135 140

 gtg ccg agc agc ctg gcc gcc gac gtg gcc tgc cgg cac ggg ctg cac 480
 Val Pro Ser Ser Leu Ala Ala Asp Val Ala Cys Arg His Gly Leu His

145	150	155	160	
ggc ccc gcg cag gtg gtc tcc acc ggc tgc acc tcg ggc atc gac gcc				528
Gly Pro Ala Gln Val Val Ser Thr Gly Cys Thr Ser Gly Ile Asp Ala				
	165	170	175	
atc ggg tac gcc cac cag ctc atc gcc gac ggc gag gcc gac atc gtg				576
Ile Gly Tyr Ala His Gln Leu Ile Ala Asp Gly Glu Ala Asp Ile Val				
	180	185	190	
ctg gcc ggg gcg gcg gac tcg cct atc tcc ccg gtg acc gtc gcg tcc				624
Leu Ala Gly Ala Ala Asp Ser Pro Ile Ser Pro Val Thr Val Ala Ser				
	195	200	205	
ttc gac gcg atc aag gcg acc agt ccc gac aac gac gat ccg gcg cac				672
Phe Asp Ala Ile Lys Ala Thr Ser Pro Asp Asn Asp Asp Pro Ala His				
	210	215	220	
gcc tcc cgc ccg ttc gac gcc gac cgg cac ggc ttc gtc ctc gcc gag				720
Ala Ser Arg Pro Phe Asp Ala Asp Arg His Gly Phe Val Leu Ala Glu				
	225	230	235	240
ggc gcg gcg gtg ctg gtg ctg gag gag gcc ggg cac gcc cgg cgg cgc				768
Gly Ala Ala Val Leu Val Leu Glu Glu Ala Gly His Ala Arg Arg Arg				
	245	250	255	
ggc gcc cac gtc tac tgc gag gtc gcc ggc tac gcc agc cgc agc aac				816
Gly Ala His Val Tyr Cys Glu Val Ala Gly Tyr Ala Ser Arg Ser Asn				
	260	265	270	
ggc tac cac atg acg ggg ctg cgg ccc gac ggg ctg gag atg ggg ctg				864
Gly Tyr His Met Thr Gly Leu Arg Pro Asp Gly Leu Glu Met Gly Leu				
	275	280	285	
gcc atc tcg gcc gcg ctc aag cag ggc cgg atc gcc ccc gag cag gtc				912
Ala Ile Ser Ala Ala Leu Lys Gln Gly Arg Ile Ala Pro Glu Gln Val				
	290	295	300	
tcc tac atc agc gcg cac ggt tcc ggc acc cgg cag aac gac cgg cac				960
Ser Tyr Ile Ser Ala His Gly Ser Gly Thr Arg Gln Asn Asp Arg His				
	305	310	315	320
gag acc gcc gcg ttc aag cgg gcc ctc ggg cag gcc gcg tac cgg gtg				1008
Glu Thr Ala Ala Phe Lys Arg Ala Leu Gly Gln Ala Ala Tyr Arg Val				
	325	330	335	
ccg atc agc tcg atc aag tcg atg gtc ggg cac tcg ctc ggc gcg atc				1056
Pro Ile Ser Ser Ile Lys Ser Met Val Gly His Ser Leu Gly Ala Ile				
	340	345	350	
ggc tcg atc gag atg gcc gcc tgc gcc ctg gcc gtc gag ttc ggc gtg				1104
Gly Ser Ile Glu Met Ala Ala Cys Ala Leu Ala Val Glu Phe Gly Val				
	355	360	365	
gtg ccg ccg acg gcc aac tgg acc acc cgg gat				1137
Val Pro Pro Thr Ala Asn Trp Thr Thr Arg Asp				

370

375

<210> 54
 <211> 379
 <212> PRT
 <213> Bacteria

<400> 54

Val Thr Gly Arg Arg Thr Val Val Thr Gly Val Gly Val Val Ala Pro
 1 5 10 15
 Gly Gly Ala Ser Arg Asp Arg Phe Trp Lys Ala Ile Thr Glu Gly Arg
 20 25 30
 Thr Ala Thr Arg Arg Ile Thr Phe Phe Asp Pro Ser Ala Phe Arg Ser
 35 40 45
 Gln Ile Ala Ala Glu Cys Asp Phe Asp Pro Val Ala Ala Gly Leu Ser
 50 55 60
 Glu Ala Glu Arg Arg Arg Ala Asp Arg Tyr Val Gln Phe Ala Leu Ala
 65 70 75 80
 Cys Ser Ala Glu Ala Val Ala Asp Ala Gly Leu Glu Leu Thr Asp Ala
 85 90 95
 Glu Arg Asp Arg Ala Gly Val Val Leu Gly Thr Ala Val Gly Gly Thr
 100 105 110
 Met Ala Leu Glu Gln Glu Tyr Val Thr Val Ser Asp Thr Gly Arg Arg
 115 120 125
 Trp Leu Val Asp Ala Ala Arg Gly Gly Pro Tyr Leu Tyr Gln Ala Leu
 130 135 140
 Val Pro Ser Ser Leu Ala Ala Asp Val Ala Cys Arg His Gly Leu His
 145 150 155 160
 Gly Pro Ala Gln Val Val Ser Thr Gly Cys Thr Ser Gly Ile Asp Ala
 165 170 175
 Ile Gly Tyr Ala His Gln Leu Ile Ala Asp Gly Glu Ala Asp Ile Val
 180 185 190
 Leu Ala Gly Ala Ala Asp Ser Pro Ile Ser Pro Val Thr Val Ala Ser
 195 200 205
 Phe Asp Ala Ile Lys Ala Thr Ser Pro Asp Asn Asp Asp Pro Ala His
 210 215 220
 Ala Ser Arg Pro Phe Asp Ala Asp Arg His Gly Phe Val Leu Ala Glu
 225 230 235 240
 Gly Ala Ala Val Leu Val Leu Glu Glu Ala Gly His Ala Arg Arg Arg
 245 250 255
 Gly Ala His Val Tyr Cys Glu Val Ala Gly Tyr Ala Ser Arg Ser Asn
 260 265 270
 Gly Tyr His Met Thr Gly Leu Arg Pro Asp Gly Leu Glu Met Gly Leu
 275 280 285
 Ala Ile Ser Ala Ala Leu Lys Gln Gly Arg Ile Ala Pro Glu Gln Val
 290 295 300
 Ser Tyr Ile Ser Ala His Gly Ser Gly Thr Arg Gln Asn Asp Arg His
 305 310 315 320
 Glu Thr Ala Ala Phe Lys Arg Ala Leu Gly Gln Ala Ala Tyr Arg Val
 325 330 335
 Pro Ile Ser Ser Ile Lys Ser Met Val Gly His Ser Leu Gly Ala Ile
 340 345 350
 Gly Ser Ile Glu Met Ala Ala Cys Ala Leu Ala Val Glu Phe Gly Val
 355 360 365
 Val Pro Pro Thr Ala Asn Trp Thr Thr Arg Asp

370

375

<210> 55

<211> 969

<212> DNA

<213> Bacteria

<220>

<221> CDS

<222> (1)...(969)

<400> 55

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atg ccc gcc aat tgg cga acc att cgt caa tac gcc ctg acg ccg ggg 48
Met Pro Ala Asn Trp Arg Thr Ile Arg Gln Tyr Ala Leu Thr Pro Gly
1 5 10 15

atg gcc cag acc acc ttc gcg acc cgg ggc ttc cgc gcc cgg gac gag 96
Met Ala Gln Thr Thr Phe Ala Thr Arg Gly Phe Arg Ala Arg Asp Glu
20 25 30

ccg acc cgc gag cgg ctg gag tcg gtc ggc gcc cac ttc ctc acc ggc 144
Pro Thr Arg Glu Arg Leu Glu Ser Val Gly Ala His Phe Leu Thr Gly
35 40 45

tac ggg cac gcc gtc ggc gcc cgg ggc ccg gac gag gcc gtc ggg gcg 192
Tyr Gly His Ala Val Gly Ala Arg Gly Pro Asp Glu Ala Val Gly Ala
50 55 60

ctg gag acc gtc gcg ccg gac ctg cgc ggg ttc gcg tac gag ggc gcg 240
Leu Glu Thr Val Ala Pro Asp Leu Arg Gly Phe Ala Tyr Glu Gly Ala
65 70 75 80

gcg atg ggc ctc gcc gtc ctg gac ggg ctg acc ggt ggc cgc cgg atc 288
Ala Met Gly Leu Ala Val Leu Asp Gly Leu Thr Gly Gly Arg Arg Ile
85 90 95

gcc cgg ttc ctg gcc ggg ccg gcc gcc cgg cac gtg tac atg gtc cat 336
Ala Arg Phe Leu Ala Gly Pro Ala Ala Arg His Val Tyr Met Val His
100 105 110

gtc ggg gtg ggc tgg gcg atg gcc cgc ctg ccc cgc tgg cgt cgg cac 384
Val Gly Val Gly Trp Ala Met Ala Arg Leu Pro Arg Trp Arg Arg His
115 120 125

gcg atc caa ccc gcc gac cgg ctg ctg ggc tgg ctg gcg ctg gac ggc 432
Ala Ile Gln Pro Ala Asp Arg Leu Leu Gly Trp Leu Ala Leu Asp Gly
130 135 140

tac gga ttc cac cag gcg tac ttc cac acc cgg cgg tac gtg tgg tcg 480
Tyr Gly Phe His Gln Ala Tyr Phe His Thr Arg Arg Tyr Val Trp Ser
145 150 155 160

cac cgg cgt gac gag gtg ctg ccc tgg ccc ggc gac ccg atc ggg cgg 528
His Arg Arg Asp Glu Val Leu Pro Trp Pro Gly Asp Pro Ile Gly Arg
165 170 175

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tgg acc ggg cgc gtc gtg gac cag ggc atc ggc cgc gcg ctg tgg ttc	576
Trp Thr Gly Arg Val Val Asp Gln Gly Ile Gly Arg Ala Leu Trp Phe	
180 185 190	
gtc gag ggc gcc gac acc gac cgg atc gcc gac acc gtc gac ggc ttc	624
Val Glu Gly Ala Asp Thr Asp Arg Ile Ala Asp Thr Val Asp Gly Phe	
195 200 205	
ccg ccg gac cgg cac gag gac ctg tac agc ggg gtg gcg ctg gcc gcc	672
Pro Pro Asp Arg His Glu Asp Leu Tyr Ser Gly Val Ala Leu Ala Ala	
210 215 220	
acg tac gcc ggc ggg gcg ccg ccc gag gac ctg cgg cgg ctg cgc gag	720
Thr Tyr Ala Gly Gly Ala Pro Pro Glu Asp Leu Arg Arg Leu Arg Glu	
225 230 235 240	
cgc ggc gga gcg tac gcc ccg gcg atg gcc cag ggc agc gcc ttc gcg	768
Arg Gly Gly Ala Tyr Ala Pro Ala Met Ala Gln Gly Ser Ala Phe Ala	
245 250 255	
gcg gag gcc cgg gag cgc gcc ggg ctg acc acc gcg cac acc gcg gtc	816
Ala Glu Ala Arg Glu Arg Ala Gly Leu Thr Thr Ala His Thr Ala Val	
260 265 270	
gcc acc gac gtc ttc tgc ggc gcg cca ccg gcc gag gcg gcg gcg gtc	864
Ala Thr Asp Val Phe Cys Gly Ala Pro Pro Ala Glu Ala Ala Ala Val	
275 280 285	
acc cag gcc gcg ctg gcc gac ctc gac cgg gac ggg ccg gag ccg gcc	912
Thr Gln Ala Ala Leu Ala Asp Leu Asp Arg Asp Gly Pro Glu Pro Ala	
290 295 300	
tac ctg gtg tgg cgg cag cgg atc gcc aag cag ttc gtg acg ctg ggg	960
Tyr Leu Val Trp Arg Gln Arg Ile Ala Lys Gln Phe Val Thr Leu Gly	
305 310 315 320	
agg tgc tga	969
Arg Cys *	

<210> 56
 <211> 322
 <212> PRT
 <213> Bacteria

<400> 56
 Met Pro Ala Asn Trp Arg Thr Ile Arg Gln Tyr Ala Leu Thr Pro Gly
 1 5 10 15
 Met Ala Gln Thr Thr Phe Ala Thr Arg Gly Phe Arg Ala Arg Asp Glu
 20 25 30
 Pro Thr Arg Glu Arg Leu Glu Ser Val Gly Ala His Phe Leu Thr Gly
 35 40 45
 Tyr Gly His Ala Val Gly Ala Arg Gly Pro Asp Glu Ala Val Gly Ala
 50 55 60

Leu Glu Thr Val Ala Pro Asp Leu Arg Gly Phe Ala Tyr Glu Gly Ala
 65 70 75 80
 Ala Met Gly Leu Ala Val Leu Asp Gly Leu Thr Gly Gly Arg Arg Ile
 85 90 95
 Ala Arg Phe Leu Ala Gly Pro Ala Ala Arg His Val Tyr Met Val His
 100 105 110
 Val Gly Val Gly Trp Ala Met Ala Arg Leu Pro Arg Trp Arg Arg His
 115 120 125
 Ala Ile Gln Pro Ala Asp Arg Leu Leu Gly Trp Leu Ala Leu Asp Gly
 130 135 140
 Tyr Gly Phe His Gln Ala Tyr Phe His Thr Arg Arg Tyr Val Trp Ser
 145 150 155 160
 His Arg Arg Asp Glu Val Leu Pro Trp Pro Gly Asp Pro Ile Gly Arg
 165 170 175
 Trp Thr Gly Arg Val Val Asp Gln Gly Ile Gly Arg Ala Leu Trp Phe
 180 185 190
 Val Glu Gly Ala Asp Thr Asp Arg Ile Ala Asp Thr Val Asp Gly Phe
 195 200 205
 Pro Pro Asp Arg His Glu Asp Leu Tyr Ser Gly Val Ala Leu Ala Ala
 210 215 220
 Thr Tyr Ala Gly Gly Ala Pro Pro Glu Asp Leu Arg Arg Leu Arg Glu
 225 230 235 240
 Arg Gly Gly Ala Tyr Ala Pro Ala Met Ala Gln Gly Ser Ala Phe Ala
 245 250 255
 Ala Glu Ala Arg Glu Arg Ala Gly Leu Thr Thr Ala His Thr Ala Val
 260 265 270
 Ala Thr Asp Val Phe Cys Gly Ala Pro Pro Ala Glu Ala Ala Ala Val
 275 280 285
 Thr Gln Ala Ala Leu Ala Asp Leu Asp Arg Asp Gly Pro Glu Pro Ala
 290 295 300
 Tyr Leu Val Trp Arg Gln Arg Ile Ala Lys Gln Phe Val Thr Leu Gly
 305 310 315 320
 Arg Cys

<210> 57
 <211> 1956
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(1956)

<400> 57
 atg ttc cgc cgg cag ttg gcc ggg ctg gtc gcg ctg gtg ctg ctc acc 48
 Met Phe Arg Arg Gln Leu Ala Gly Leu Val Ala Leu Val Leu Leu Thr
 1 5 10 15
 ggc atg tac gtg ctg gtc cgg cag ccg gag gcg aac gcc gac gag cgg 96
 Gly Met Tyr Val Leu Val Arg Gln Pro Glu Ala Asn Ala Asp Glu Arg
 20 25 30
 cgc gcc atg gcg gag ccg tac cgg ttc acg ccg atg tcg ctg ccg atg 144
 Arg Ala Met Ala Glu Pro Tyr Arg Phe Thr Pro Met Ser Leu Pro Met

35	40	45	
ccg ggc ggc ctg ccg cag cag tcg atc cgc cgg gtc aac ggc gcg tac			192
Pro Gly Gly Leu Pro Gln Gln Ser Ile Arg Arg Val Asn Gly Ala Tyr			
50	55	60	
cag cac ctg gcg gcg tgg atc tcc tcc gtc ggc gcc ggc gcc gcg atg			240
Gln His Leu Ala Ala Trp Ile Ser Ser Val Gly Ala Gly Ala Ala Met			
65	70	75	80
aac gac ctg gac ggt gac gga ctg gcc aac gac ctg tgc gtc acc gac			288
Asn Asp Leu Asp Gly Asp Gly Leu Ala Asn Asp Leu Cys Val Thr Asp			
85	90	95	
cca cgc gtc gac cgc gtc gtg gtg acc ccg gcc ccg acc gcc ggc gcc			336
Pro Arg Val Asp Arg Val Val Val Thr Pro Ala Pro Thr Ala Gly Ala			
100	105	110	
gac cgc tac cag ccg ttc gtg ctg gac ccg gcg ccg ctg ccg atg aac			384
Asp Arg Tyr Gln Pro Phe Val Leu Asp Pro Ala Pro Leu Pro Met Asn			
115	120	125	
ccg tac gtc gcc ccg atg ggc tgc ctg ccc ggc gac ctc aac gcc gac			432
Pro Tyr Val Ala Pro Met Gly Cys Leu Pro Gly Asp Leu Asn Ala Asp			
130	135	140	
ggc cgc acc gac ctg ctc gtg tac tgg tgg ggc cgg acc ccg gtg gtc			480
Gly Arg Thr Asp Leu Leu Val Tyr Trp Trp Gly Arg Thr Pro Val Val			
145	150	155	160
ttc ctg gcc cgg gcg gac gcg acc ggg ctg tcc cgg gcc gcc tac cac			528
Phe Leu Ala Arg Ala Asp Ala Thr Gly Leu Ser Arg Ala Ala Tyr His			
165	170	175	
ccc gtc gag ctg gtg ccg ggc gcg gcg acc ggc ggt agc cgg tac gac			576
Pro Val Glu Leu Val Pro Gly Ala Ala Thr Gly Gly Ser Arg Tyr Asp			
180	185	190	
ggg ccg aag tgg aac acc aac gcc gcg acg ctg gcc gac ttc gac ggc			624
Gly Pro Lys Trp Asn Thr Asn Ala Ala Thr Leu Ala Asp Phe Asp Gly			
195	200	205	
gac ggg cac ctg gac gtc tac atc ggc aac tac ttc ccc gac agc gcc			672
Asp Gly His Leu Asp Val Tyr Ile Gly Asn Tyr Phe Pro Asp Ser Ala			
210	215	220	
gtc ctc gac gac acc gtc cac ggc ggg gtg gcg atg aac cgg tcc atg			720
Val Leu Asp Asp Thr Val His Gly Gly Val Ala Met Asn Arg Ser Met			
225	230	235	240
tcc aac ggc ctc aac ggc ggc gag gac cac gtg ttc cgg tgg acc ggc			768
Ser Asn Gly Leu Asn Gly Gly Glu Asp His Val Phe Arg Trp Thr Gly			
245	250	255	
ggc acc gcc ggc gcc acg ccg agc gcc tcc ttc gcc gag gtc ccg gac			816
Gly Thr Ala Gly Ala Thr Pro Ser Ala Ser Phe Ala Glu Val Pro Asp			

260					265					270						
gtc	ttc	gac	acc	aag	gtc	tcc	cgg	ggc	tgg	acg	ctc	gcc	gtc	gcc	gcg	864
Val	Phe	Asp	Thr	Lys	Val	Ser	Arg	Gly	Trp	Thr	Leu	Ala	Val	Ala	Ala	
		275					280					285				
aac	gac	ctc	gac	ggc	gac	caa	ctg	ccc	gag	ctg	tac	gtg	gcc	aac	gac	912
Asn	Asp	Leu	Asp	Gly	Asp	Gln	Leu	Pro	Glu	Leu	Tyr	Val	Ala	Asn	Asp	
		290					295					300				
ttc	ggg	ccg	gac	cgg	ctg	ctg	cac	aac	cgg	tcg	gag	cgg	ggg	cgg	atc	960
Phe	Gly	Pro	Asp	Arg	Leu	Leu	His	Asn	Arg	Ser	Glu	Arg	Gly	Arg	Ile	
		305					310					315			320	
gcc	ttc	gcg	ccg	gtc	gag	agc	ccc	ggg	ctg	ccc	ggc	ctg	acc	ccc	aag	1008
Ala	Phe	Ala	Pro	Val	Glu	Ser	Pro	Gly	Leu	Pro	Gly	Leu	Thr	Pro	Lys	
				325					330						335	
tca	aag	cgg	ctc	ggc	cac	gac	tcg	ttc	aag	ggc	atg	ggc	gtg	gac	ttc	1056
Ser	Lys	Arg	Leu	Gly	His	Asp	Ser	Phe	Lys	Gly	Met	Gly	Val	Asp	Phe	
			340					345							350	
ggc	gac	atc	gac	ggc	gac	ggc	atg	ttc	gac	ctg	tac	gtc	ggc	aac	atc	1104
Gly	Asp	Ile	Asp	Gly	Asp	Gly	Met	Phe	Asp	Leu	Tyr	Val	Gly	Asn	Ile	
		355					360					365				
acc	acc	tcc	ttc	ggc	atc	cag	gag	agc	aac	ttc	gcc	ttc	gtc	aac	acc	1152
Thr	Thr	Ser	Phe	Gly	Ile	Gln	Glu	Ser	Asn	Phe	Ala	Phe	Val	Asn	Thr	
		370					375					380				
gcc	gcc	gac	acc	gcc	gcg	ctg	cgc	gcc	gcg	ctg	tgg	gcc	ggc	gag	gcg	1200
Ala	Ala	Asp	Thr	Ala	Ala	Leu	Arg	Ala	Ala	Leu	Trp	Ala	Gly	Glu	Ala	
		385					390					395			400	
ccg	tgg	cac	gac	cgc	agc	gcc	gag	ctg	ggc	ctg	gcc	tgg	agc	ggg	tgg	1248
Pro	Trp	His	Asp	Arg	Ser	Ala	Glu	Leu	Gly	Leu	Ala	Trp	Ser	Gly	Trp	
				405					410						415	
agc	tgg	gac	gtc	aag	ttc	ggc	gac	ttc	acc	aac	cgc	ggc	gac	ccg	gcg	1296
Ser	Trp	Asp	Val	Lys	Phe	Gly	Asp	Phe	Thr	Asn	Arg	Gly	Asp	Pro	Ala	
			420					425							430	
atc	gtg	cag	acc	tcc	ggc	ttc	gtc	aag	ggc	gag	gtc	aac	cgc	tgg	gcg	1344
Ile	Val	Gln	Thr	Ser	Gly	Phe	Val	Lys	Gly	Glu	Val	Asn	Arg	Trp	Ala	
			435					440							445	
cag	ttg	cag	gag	gcg	gcc	acc	gcc	aac	gac	gac	ctg	ctc	gcc	aac	ccc	1392
Gln	Leu	Gln	Glu	Ala	Ala	Thr	Ala	Asn	Asp	Asp	Leu	Leu	Ala	Asn	Pro	
			450				455								460	
cgc	tgg	tgg	ccg	aag	gtc	gag	cag	ggc	gac	gac	atc	gcc	ggc	ggc	cag	1440
Arg	Trp	Trp	Pro	Lys	Val	Glu	Gln	Gly	Asp	Asp	Ile	Ala	Gly	Gly	Gln	
			465				470					475			480	
cac	ctc	gcc	ttc	cac	gtc	cgg	ggc	gcc	gac	ggc	cgc	tac	gag	gac	ctc	1488
His	Leu	Ala	Phe	His	Val	Arg	Gly	Ala	Asp	Gly	Arg	Tyr	Glu	Asp	Leu	

485										490										495										
agc	cac	gaa	ctg	ggc	ctg	gcc	gac	cgg	gtg	ccc	agc	cgg	ggc	atc	gcc	1536														
Ser	His	Glu	Leu	Gly	Leu	Ala	Asp	Arg	Val	Pro	Ser	Arg	Gly	Ile	Ala															
500					505					510																				
acc	gcc	gac	gcc	gac	ggc	gac	ggg	cgc	ctc	gac	ctc	gtc	gtc	gcc	cgg	1584														
Thr	Ala	Asp	Ala	Asp	Gly	Asp	Gly	Arg	Leu	Asp	Leu	Val	Val	Ala	Arg															
515					520					525																				
cag	tgg	gac	gcg	ccg	gtc	ttc	tac	cgc	aac	gac	agc	ccg	gac	acc	ggc	1632														
Gln	Trp	Asp	Ala	Pro	Val	Phe	Tyr	Arg	Asn	Asp	Ser	Pro	Asp	Thr	Gly															
530					535					540																				
tcc	ttc	ctc	acc	ctg	cgg	ctg	ctg	cac	gag	cag	gcg	ccg	gcc	gcc	ggc	1680														
Ser	Phe	Leu	Thr	Leu	Arg	Leu	Leu	His	Glu	Gln	Ala	Pro	Ala	Ala	Gly															
545					550					555					560															
ccc	ctc	gcc	ggg	gcg	ggg	tcg	ccg	gtc	gtc	ggc	gcg	cag	gtc	cgg	gtg	1728														
Pro	Leu	Ala	Gly	Ala	Gly	Ser	Pro	Val	Val	Gly	Ala	Gln	Val	Arg	Val															
565					570					575																				
acc	acg	ccg	gac	ggc	cgg	gtg	ctc	atc	gac	cgg	gtc	gac	ggc	ggc	agc	1776														
Thr	Thr	Pro	Asp	Gly	Arg	Val	Leu	Ile	Asp	Arg	Val	Asp	Gly	Gly	Ser															
580					585					590																				
ggc	cac	tcg	ggc	cgg	cgc	agc	aac	gag	gtg	tcg	ctc	ggt	ctc	gac	gac	1824														
Gly	His	Ser	Gly	Arg	Arg	Ser	Asn	Glu	Val	Ser	Leu	Gly	Leu	Asp	Asp															
595					600					605																				
gtg	acc	ggc	ccg	gtg	tcg	gtc	cac	ctc	acc	tgg	cgg	gac	cgg	tcc	ggc	1872														
Val	Thr	Gly	Pro	Val	Ser	Val	His	Leu	Thr	Trp	Arg	Asp	Arg	Ser	Gly															
610					615					620																				
gcc	ccg	cac	gag	cag	gag	ctg	acg	ctg	gcc	ccc	ggt	cga	cac	acc	ctc	1920														
Ala	Pro	His	Glu	Gln	Glu	Leu	Thr	Leu	Ala	Pro	Gly	Arg	His	Thr	Leu															
625					630					635					640															
acc	ctc	ggt	tcg	cag	gct	cgg	gag	gtc	tcg	cga	tga					1956														
Thr	Leu	Gly	Ser	Gln	Ala	Arg	Glu	Val	Ser	Arg	*																			
645					650																									

<210> 58

<211> 651

<212> PRT

<213> Bacteria

<400> 58

Met	Phe	Arg	Arg	Gln	Leu	Ala	Gly	Leu	Val	Ala	Leu	Val	Leu	Leu	Thr
1				5					10					15	
Gly	Met	Tyr	Val	Leu	Val	Arg	Gln	Pro	Glu	Ala	Asn	Ala	Asp	Glu	Arg
			20					25					30		
Arg	Ala	Met	Ala	Glu	Pro	Tyr	Arg	Phe	Thr	Pro	Met	Ser	Leu	Pro	Met
			35				40					45			
Pro	Gly	Gly	Leu	Pro	Gln	Gln	Ser	Ile	Arg	Arg	Val	Asn	Gly	Ala	Tyr

50	55	60
Gln His Leu Ala Ala Trp Ile Ser Ser Val Gly Ala Gly Ala Ala Met		
65	70	75
Asn Asp Leu Asp Gly Asp Gly Leu Ala Asn Asp Leu Cys Val Thr Asp		80
	85	90
Pro Arg Val Asp Arg Val Val Val Thr Pro Ala Pro Thr Ala Gly Ala		95
	100	105
Asp Arg Tyr Gln Pro Phe Val Leu Asp Pro Ala Pro Leu Pro Met Asn		110
	115	120
Pro Tyr Val Ala Pro Met Gly Cys Leu Pro Gly Asp Leu Asn Ala Asp		125
	130	135
Gly Arg Thr Asp Leu Leu Val Tyr Trp Trp Gly Arg Thr Pro Val Val		140
145	150	155
Phe Leu Ala Arg Ala Asp Ala Thr Gly Leu Ser Arg Ala Ala Tyr His		160
	165	170
Pro Val Glu Leu Val Pro Gly Ala Ala Thr Gly Gly Ser Arg Tyr Asp		175
	180	185
Gly Pro Lys Trp Asn Thr Asn Ala Ala Thr Leu Ala Asp Phe Asp Gly		190
	195	200
Asp Gly His Leu Asp Val Tyr Ile Gly Asn Tyr Phe Pro Asp Ser Ala		205
210	215	220
Val Leu Asp Asp Thr Val His Gly Gly Val Ala Met Asn Arg Ser Met		225
225	230	235
Ser Asn Gly Leu Asn Gly Gly Glu Asp His Val Phe Arg Trp Thr Gly		240
	245	250
Gly Thr Ala Gly Ala Thr Pro Ser Ala Ser Phe Ala Glu Val Pro Asp		255
	260	265
Val Phe Asp Thr Lys Val Ser Arg Gly Trp Thr Leu Ala Val Ala Ala		270
	275	280
Asn Asp Leu Asp Gly Asp Gln Leu Pro Glu Leu Tyr Val Ala Asn Asp		285
290	295	300
Phe Gly Pro Asp Arg Leu Leu His Asn Arg Ser Glu Arg Gly Arg Ile		305
305	310	315
Ala Phe Ala Pro Val Glu Ser Pro Gly Leu Pro Gly Leu Thr Pro Lys		320
	325	330
Ser Lys Arg Leu Gly His Asp Ser Phe Lys Gly Met Gly Val Asp Phe		335
	340	345
Gly Asp Ile Asp Gly Asp Gly Met Phe Asp Leu Tyr Val Gly Asn Ile		350
	355	360
Thr Thr Ser Phe Gly Ile Gln Glu Ser Asn Phe Ala Phe Val Asn Thr		365
	370	375
Ala Ala Asp Thr Ala Ala Leu Arg Ala Ala Leu Trp Ala Gly Glu Ala		380
385	390	395
Pro Trp His Asp Arg Ser Ala Glu Leu Gly Leu Ala Trp Ser Gly Trp		400
	405	410
Ser Trp Asp Val Lys Phe Gly Asp Phe Thr Asn Arg Gly Asp Pro Ala		415
	420	425
Ile Val Gln Thr Ser Gly Phe Val Lys Gly Glu Val Asn Arg Trp Ala		430
	435	440
Gln Leu Gln Glu Ala Ala Thr Ala Asn Asp Asp Leu Leu Ala Asn Pro		445
	450	455
Arg Trp Trp Pro Lys Val Glu Gln Gly Asp Asp Ile Ala Gly Gly Gln		460
465	470	475
His Leu Ala Phe His Val Arg Gly Ala Asp Gly Arg Tyr Glu Asp Leu		480
	485	490
Ser His Glu Leu Gly Leu Ala Asp Arg Val Pro Ser Arg Gly Ile Ala		495

	500		505		510										
Thr	Ala	Asp	Ala	Asp	Gly	Asp	Gly	Arg	Leu	Asp	Leu	Val	Val	Ala	Arg
	515						520					525			
Gln	Trp	Asp	Ala	Pro	Val	Phe	Tyr	Arg	Asn	Asp	Ser	Pro	Asp	Thr	Gly
	530						535					540			
Ser	Phe	Leu	Thr	Leu	Arg	Leu	Leu	His	Glu	Gln	Ala	Pro	Ala	Ala	Gly
545					550					555					560
Pro	Leu	Ala	Gly	Ala	Gly	Ser	Pro	Val	Val	Gly	Ala	Gln	Val	Arg	Val
			565						570					575	
Thr	Thr	Pro	Asp	Gly	Arg	Val	Leu	Ile	Asp	Arg	Val	Asp	Gly	Gly	Ser
			580					585					590		
Gly	His	Ser	Gly	Arg	Arg	Ser	Asn	Glu	Val	Ser	Leu	Gly	Leu	Asp	Asp
	595						600					605			
Val	Thr	Gly	Pro	Val	Ser	Val	His	Leu	Thr	Trp	Arg	Asp	Arg	Ser	Gly
	610					615					620				
Ala	Pro	His	Glu	Gln	Glu	Leu	Thr	Leu	Ala	Pro	Gly	Arg	His	Thr	Leu
625					630					635					640
Thr	Leu	Gly	Ser	Gln	Ala	Arg	Glu	Val	Ser	Arg					
				645					650						

<210> 59

<211> 630

<212> DNA

<213> Bacteria

<220>

<221> CDS

<222> (1)...(630)

<400> 59

atg ggc gaa acg gga cgt cag ttg gcc gtc gtc acg gcg gac gcc gac	48
Met Gly Glu Thr Gly Arg Gln Leu Ala Val Val Thr Ala Asp Ala Asp	
1 5 10 15	
gtc gtg gag gcg gag ctg gtg gac gac gag acg gcc ggc gcc tcc gtc	96
Val Val Glu Ala Glu Leu Val Asp Asp Glu Thr Ala Gly Ala Ser Val	
20 25 30	
gtc gtc cac acg gac cgc gac cgg cac ctc tcc ccc gag acc gtc gcc	144
Val Val His Thr Asp Arg Asp Arg His Leu Ser Pro Glu Thr Val Ala	
35 40 45	
gcc atc gcg gcg agc gtc gcc gac tcc acc cgc cgc gcg tac ggc acc	192
Ala Ile Ala Ala Ser Val Ala Asp Ser Thr Arg Arg Ala Tyr Gly Thr	
50 55 60	
gac cgg gcc gcg ttc gcc gcc tgg tgc gcc gag gag gac cgc acg gcc	240
Asp Arg Ala Ala Phe Ala Ala Trp Cys Ala Glu Glu Asp Arg Thr Ala	
65 70 75 80	
gtc ccc gcg tcg gcg gag acg atg gcg gag tgg gtg cgg cac ctg acc	288
Val Pro Ala Ser Ala Glu Thr Met Ala Glu Trp Val Arg His Leu Thr	
85 90 95	
gtc acg ccc cgc ccc cgg acg cag cga ccg gcc ggg ccg tcg acc atc	336

Val	Thr	Pro	Arg	Pro	Arg	Thr	Gln	Arg	Pro	Ala	Gly	Pro	Ser	Thr	Ile	
			100					105					110			
gag	cgg	gcc	atg	tcc	gcc	gtg	acc	acc	tgg	cac	gag	gag	cag	gga	cgg	384
Glu	Arg	Ala	Met	Ser	Ala	Val	Thr	Thr	Trp	His	Glu	Glu	Gln	Gly	Arg	
		115					120					125				
ccg	aag	ccg	aac	atg	cgc	ggc	gcc	cgg	gcc	gtc	ctc	aac	gcc	tac	aag	432
Pro	Lys	Pro	Asn	Met	Arg	Gly	Ala	Arg	Ala	Val	Leu	Asn	Ala	Tyr	Lys	
	130					135					140					
gac	cgg	ctc	gcc	gtg	gag	aag	gcg	gag	gcc	gcg	cag	gcc	cgc	cag	gcg	480
Asp	Arg	Leu	Ala	Val	Glu	Lys	Ala	Glu	Ala	Ala	Gln	Ala	Arg	Gln	Ala	
145					150				155					160		
acc	gcc	gcc	ctc	ccc	ccg	cag	atc	cgc	gcc	atg	ctc	gcc	ggg	gtc	gac	528
Thr	Ala	Ala	Leu	Pro	Pro	Gln	Ile	Arg	Ala	Met	Leu	Ala	Gly	Val	Asp	
			165					170					175			
cgg	acc	acc	ctc	gcc	ggg	aag	cgg	aac	gcg	gcc	tgg	tcc	tcc	tcg	gtt	576
Arg	Thr	Thr	Leu	Ala	Gly	Lys	Arg	Asn	Ala	Ala	Trp	Ser	Ser	Ser	Val	
			180					185					190			
cgc	cac	ggc	ggc	cgc	gtc	ctc	cga	gct	ggt	cgc	agc	tgg	acg	tcg	aca	624
Arg	His	Gly	Gly	Arg	Val	Leu	Arg	Ala	Gly	Arg	Ser	Trp	Thr	Ser	Thr	
		195					200					205				
cgg	tga														630	
Arg	*															

<210> 60
 <211> 209
 <212> PRT
 <213> Bacteria

<400> 60
 Met Gly Glu Thr Gly Arg Gln Leu Ala Val Val Thr Ala Asp Ala Asp
 1 5 10 15
 Val Val Glu Ala Glu Leu Val Asp Asp Glu Thr Ala Gly Ala Ser Val
 20 25 30
 Val Val His Thr Asp Arg Asp Arg His Leu Ser Pro Glu Thr Val Ala
 35 40 45
 Ala Ile Ala Ala Ser Val Ala Asp Ser Thr Arg Arg Ala Tyr Gly Thr
 50 55 60
 Asp Arg Ala Ala Phe Ala Ala Trp Cys Ala Glu Glu Asp Arg Thr Ala
 65 70 75 80
 Val Pro Ala Ser Ala Glu Thr Met Ala Glu Trp Val Arg His Leu Thr
 85 90 95
 Val Thr Pro Arg Pro Arg Thr Gln Arg Pro Ala Gly Pro Ser Thr Ile
 100 105 110
 Glu Arg Ala Met Ser Ala Val Thr Trp His Glu Glu Gln Gly Arg
 115 120 125
 Pro Lys Pro Asn Met Arg Gly Ala Arg Ala Val Leu Asn Ala Tyr Lys
 130 135 140

Asp Arg Leu Ala Val Glu Lys Ala Glu Ala Ala Gln Ala Arg Gln Ala
 145 150 155 160
 Thr Ala Ala Leu Pro Pro Gln Ile Arg Ala Met Leu Ala Gly Val Asp
 165 170 175
 Arg Thr Thr Leu Ala Gly Lys Arg Asn Ala Ala Trp Ser Ser Ser Val
 180 185 190
 Arg His Gly Gly Arg Val Leu Arg Ala Gly Arg Ser Trp Thr Ser Thr
 195 200 205
 Arg

<210> 61
 <211> 1566
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(1566)

<400> 61
 gtg ttc ttc gag gac tgc acc ctc gcg gag gcc acc tat ccc acg ctg 48
 Val Phe Phe Glu Asp Cys Thr Leu Ala Glu Ala Thr Tyr Pro Thr Leu
 1 5 10 15
 ttc gcc ggg gtg gac gtc gtg ccg tcc agc gtc gac ctc cag cgc gtg 96
 Phe Ala Gly Val Asp Val Val Pro Ser Ser Val Asp Leu Gln Arg Val
 20 25 30
 gag tac gaa cgg ccc atc ggc gcg gag cag ggc ctc gcc gcc gcc ctg 144
 Glu Tyr Glu Arg Pro Ile Gly Ala Glu Gln Gly Leu Ala Ala Ala Leu
 35 40 45
 gcg cag gag gcg gag gag gcc ggc ggc cgc tcc ccg tac gac gtg acc 192
 Ala Gln Glu Ala Glu Glu Ala Gly Gly Arg Ser Pro Tyr Asp Val Thr
 50 55 60
 ctg atc gac gcc gcg ccg tcc ctc ggg ctg gtc acc gtt gcc gca ctc 240
 Leu Ile Asp Ala Ala Pro Ser Leu Gly Leu Val Thr Val Ala Ala Leu
 65 70 75 80
 acc gcc gcc gac gag gcc ctg gtg ccc atc aag gtc ggc ggc ctg gac 288
 Thr Ala Ala Asp Glu Ala Leu Val Pro Ile Lys Val Gly Gly Leu Asp
 85 90 95
 atg aag gcc atg gcg tcc ctc cac aag acg ctc cgc agc gtc cag cgg 336
 Met Lys Ala Met Ala Ser Leu His Lys Thr Leu Arg Ser Val Gln Arg
 100 105 110
 aag acg aac ccg aag ctg agc gtc ggg gcc gtc ctg ctg acc gcg tgg 384
 Lys Thr Asn Pro Lys Leu Ser Val Gly Ala Val Leu Thr Ala Trp
 115 120 125
 gac aag agc acg ttt gcc cgg cag ctc gcc acg aag gtg agc gag gac 432
 Asp Lys Ser Thr Phe Ala Arg Gln Leu Ala Thr Lys Val Ser Glu Asp

130	135	140	
tac ccg gag gcg gcc gtc gtg ccg atc cgg cgc agc atc cgc gcg tcg			480
Tyr Pro Glu Ala Ala Val Val Pro Ile Arg Arg Ser Ile Arg Ala Ser			
145	150	155	160
gag gcc ccg ctc tcc gag gag ccg atc cgc ctg tac gcg ccc gag gcg			528
Glu Ala Pro Leu Ser Glu Glu Pro Ile Arg Leu Tyr Ala Pro Glu Ala			
	165	170	175
gcc ccg gcc ggg gac tac gac cag tgc ggc cgc cgt cct cct gcc ggg			576
Ala Pro Ala Gly Asp Tyr Asp Gln Cys Gly Arg Arg Pro Pro Ala Gly			
	180	185	190
gag ggc tgc cgc gtg agc cgc cgc tcc ctc gcc ctc ccg tcg acc agg			624
Glu Gly Cys Arg Val Ser Arg Arg Ser Leu Ala Leu Pro Ser Thr Arg			
	195	200	205
agc acc gag ccg gac cac gcc gac gag ctg gag gcc gcc ccc gaa gag			672
Ser Thr Glu Pro Asp His Ala Asp Glu Leu Glu Ala Ala Pro Glu Glu			
	210	215	220
aag ctc gcg gcc gcg ccg tcc gcc ggg gtg gtc gcc tcg ctg acc ggc			720
Lys Leu Ala Ala Ala Arg Ser Ala Gly Val Val Ala Ser Leu Thr Gly			
	225	230	235
gcg gac ctg tcg acg ccc ctc acc gtg gcg cag ctc ccc acg ccg tac			768
Ala Asp Leu Ser Thr Pro Leu Thr Val Ala Gln Leu Pro Thr Pro Tyr			
	245	250	255
gac gtc gcg gag acc gtc acg gcg ccg ctg aac gac cag gag cgc ggt			816
Asp Val Ala Glu Thr Val Thr Ala Pro Leu Asn Asp Gln Glu Arg Gly			
	260	265	270
tac ctg gac gtg tgc gag cag gcc ctc cac ggc ttc ccg aag tcc gtc			864
Tyr Leu Asp Val Cys Glu Gln Ala Leu His Gly Phe Arg Lys Ser Val			
	275	280	285
gtc gtc gcg ggc aag gcc ctg gag gtc atc aac cgc ggc cgc ctc tac			912
Val Val Ala Gly Lys Ala Leu Glu Val Ile Asn Arg Gly Arg Leu Tyr			
	290	295	300
ccg gag acg cac gag acg ttc gcg gac tac gtg acg gag gtg tgg gac			960
Arg Glu Thr His Glu Thr Phe Ala Asp Tyr Val Thr Glu Val Trp Asp			
	305	310	315
atg aag ccg gcc cac gcc tat ccg atg atc gag ggg tgg cga ccg gcc			1008
Met Lys Arg Ala His Ala Tyr Arg Met Ile Glu Gly Trp Arg Pro Ala			
	325	330	335
gac ctc gtg tct cca att gga gac atc aac gag ggc cag gcc cgc gag			1056
Asp Leu Val Ser Pro Ile Gly Asp Ile Asn Glu Gly Gln Ala Arg Glu			
	340	345	350
ctg gcg ccc gtg ctc aag gag tac ggg ccc gag gtg acc gtc acc ctg			1104
Leu Ala Pro Val Leu Lys Glu Tyr Gly Pro Glu Val Thr Val Thr Leu			

355	360	365	
tac cgg ggg gtc aag gag ctg cgc ggc gac cgg cgg gtg acg gct gcg			1152
Tyr Arg Gly Val Lys Glu Leu Arg Gly Asp Arg Arg Val Thr Ala Ala			
370	375	380	
gac ctc tcg gag gcc cgg gca gcg ctg cct ccg ccg aag cac ctc gcc			1200
Asp Leu Ser Glu Ala Arg Ala Ala Leu Pro Pro Pro Lys His Leu Ala			
385	390	395	400
cgg ccg gac cag gtg cgc gac gtc ctc acc gtg gcg gcc gcc gag ggc			1248
Arg Pro Asp Gln Val Arg Asp Val Leu Thr Val Ala Ala Ala Glu Gly			
405	410	415	
cgc gcg ccc cgg ctc gcc ccg gcc gag ccg aag gtg ccg gcc cag gcc			1296
Arg Ala Pro Arg Leu Ala Pro Ala Glu Pro Lys Val Pro Ala Gln Ala			
420	425	430	
gcc gac gag cac cag gcc gag cag gtc gac gag ggc ggc gta agt cag			1344
Ala Asp Glu His Gln Ala Glu Gln Val Asp Glu Gly Gly Val Ser Gln			
435	440	445	
gac cag gtc gac gag ggc gcg gag gcc atc gcc acc ctg gag gcc gcc			1392
Asp Gln Val Asp Glu Gly Ala Glu Ala Ile Ala Thr Leu Glu Ala Ala			
450	455	460	
gtg gcc cag caa cgg cag atc tat gac cgg gtg ggc ggc ggg act ctc			1440
Val Ala Gln Gln Arg Gln Ile Tyr Asp Arg Val Gly Gly Gly Thr Leu			
465	470	475	480
gcg gcc gcc ctg ctg tac gac cca ggc cgg ggt gac cat ctg cgc cgc			1488
Ala Ala Ala Leu Leu Tyr Asp Pro Gly Arg Gly Asp His Leu Arg Arg			
485	490	495	
gag ctg cgg cag tac gcg cag cgg acg gcg tac cgg gca cgg gat acc			1536
Glu Leu Arg Gln Tyr Ala Gln Arg Thr Ala Tyr Arg Ala Arg Asp Thr			
500	505	510	
tcc ggt gag cag gtg gcc gac gac gcg taa			1566
Ser Gly Glu Gln Val Ala Asp Asp Ala *			
515	520		

<210> 62
 <211> 521
 <212> PRT
 <213> Bacteria

<400> 62
 Val Phe Phe Glu Asp Cys Thr Leu Ala Glu Ala Thr Tyr Pro Thr Leu
 1 5 10 15
 Phe Ala Gly Val Asp Val Val Pro Ser Val Asp Leu Gln Arg Val
 20 25 30
 Glu Tyr Glu Arg Pro Ile Gly Ala Glu Gln Gly Leu Ala Ala Leu
 35 40 45
 Ala Gln Glu Ala Glu Glu Ala Gly Gly Arg Ser Pro Tyr Asp Val Thr

50	55	60
Leu Ile Asp Ala Ala Pro Ser Leu Gly Leu Val Thr Val Ala Ala Leu		
65	70	75
Thr Ala Ala Asp Glu Ala Leu Val Pro Ile Lys Val Gly Gly Leu Asp		80
	85	90
Met Lys Ala Met Ala Ser Leu His Lys Thr Leu Arg Ser Val Gln Arg		95
	100	105
Lys Thr Asn Pro Lys Leu Ser Val Gly Ala Val Leu Leu Thr Ala Trp		110
	115	120
Asp Lys Ser Thr Phe Ala Arg Gln Leu Ala Thr Lys Val Ser Glu Asp		125
	130	135
Tyr Pro Glu Ala Ala Val Val Pro Ile Arg Arg Ser Ile Arg Ala Ser		140
145	150	155
Glu Ala Pro Leu Ser Glu Glu Pro Ile Arg Leu Tyr Ala Pro Glu Ala		160
	165	170
Ala Pro Ala Gly Asp Tyr Asp Gln Cys Gly Arg Arg Pro Pro Ala Gly		175
	180	185
Glu Gly Cys Arg Val Ser Arg Arg Ser Leu Ala Leu Pro Ser Thr Arg		190
	195	200
Ser Thr Glu Pro Asp His Ala Asp Glu Leu Glu Ala Ala Pro Glu Glu		205
	210	215
Lys Leu Ala Ala Ala Arg Ser Ala Gly Val Val Ala Ser Leu Thr Gly		220
225	230	235
Ala Asp Leu Ser Thr Pro Leu Thr Val Ala Gln Leu Pro Thr Pro Tyr		240
	245	250
Asp Val Ala Glu Thr Val Thr Ala Pro Leu Asn Asp Gln Glu Arg Gly		255
	260	265
Tyr Leu Asp Val Cys Glu Gln Ala Leu His Gly Phe Arg Lys Ser Val		270
	275	280
Val Val Ala Gly Lys Ala Leu Glu Val Ile Asn Arg Gly Arg Leu Tyr		285
	290	295
Arg Glu Thr His Glu Thr Phe Ala Asp Tyr Val Thr Glu Val Trp Asp		300
305	310	315
Met Lys Arg Ala His Ala Tyr Arg Met Ile Glu Gly Trp Arg Pro Ala		320
	325	330
Asp Leu Val Ser Pro Ile Gly Asp Ile Asn Glu Gly Gln Ala Arg Glu		335
	340	345
Leu Ala Pro Val Leu Lys Glu Tyr Gly Pro Glu Val Thr Val Thr Leu		350
	355	360
Tyr Arg Gly Val Lys Glu Leu Arg Gly Asp Arg Arg Val Thr Ala Ala		365
	370	375
Asp Leu Ser Glu Ala Arg Ala Ala Leu Pro Pro Pro Lys His Leu Ala		380
385	390	395
Arg Pro Asp Gln Val Arg Asp Val Leu Thr Val Ala Ala Ala Glu Gly		400
	405	410
Arg Ala Pro Arg Leu Ala Pro Ala Glu Pro Lys Val Pro Ala Gln Ala		415
	420	425
Ala Asp Glu His Gln Ala Glu Gln Val Asp Glu Gly Gly Val Ser Gln		430
	435	440
Asp Gln Val Asp Glu Gly Ala Glu Ala Ile Ala Thr Leu Glu Ala Ala		445
	450	455
Val Ala Gln Gln Arg Gln Ile Tyr Asp Arg Val Gly Gly Gly Thr Leu		460
465	470	475
Ala Ala Ala Leu Leu Tyr Asp Pro Gly Arg Gly Asp His Leu Arg Arg		480
	485	490
Glu Leu Arg Gln Tyr Ala Gln Arg Thr Ala Tyr Arg Ala Arg Asp Thr		495

Lys Thr Ile Pro Ala Thr Arg Arg Arg Ala Ala Gly Glu Thr Arg *
 165 170 175

<210> 64
 <211> 175
 <212> PRT
 <213> Bacteria

<400> 64
 Met Gly Glu Ala Arg Val Pro Thr Arg Lys Arg Gly Pro Asn Met Ala
 1 5 10 15
 Leu Val Asn Met Asp Thr Gly Glu Ala Val Ser Ala Arg Pro Arg Thr
 20 25 30
 Pro His Gln Phe Asp Gly Lys Gly Tyr Thr Leu Gln Ala Val Gly Ser
 35 40 45
 Asp Val Pro Leu Tyr Ser Leu Gly Leu Ala Ala Ala Glu Trp Ala Thr
 50 55 60
 Leu Glu Trp Leu Arg Glu His Gly Gly Ala Ala Gly Tyr Val Pro Val
 65 70 75 80
 Thr Pro Glu Glu Leu Gly Glu Asp Val Gly Ala Ser Lys Asp Thr Cys
 85 90 95
 Arg Lys Ala Leu Asn Arg Leu Val Lys Leu Gly Leu Val Val Lys Pro
 100 105 110
 Gly Pro Arg Ser Gly Ser Tyr Gln Leu Asn Pro Leu Arg Tyr Trp Glu
 115 120 125
 Gly Ala Gly Ser Thr Gln Val Asn Ala Cys Arg Arg Met Ala Pro Pro
 130 135 140
 Arg Val Ala Pro Asp Asp Lys Ala Met Thr Arg Ser Ala Ser Lys Pro
 145 150 155 160
 Lys Thr Ile Pro Ala Thr Arg Arg Arg Ala Ala Gly Glu Thr Arg
 165 170 175

<210> 65
 <211> 420
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(420)

<400> 65
 atg acg acc atg ccc gta gaa ggc ttc aac ccg gag cgc gac ctg acc 48
 Met Thr Thr Met Pro Val Glu Gly Phe Asn Pro Glu Arg Asp Leu Thr
 1 5 10 15
 gcc ccg tcg ctg tac tcg ctg aac ctg tcc gcc gct cag cac tgc acg 96
 Ala Pro Ser Leu Tyr Ser Leu Asn Leu Ser Ala Ala Gln His Cys Thr
 20 25 30
 ctc gcg tgg gtg gag gac cac ggc ggc ctg ttt gac gtc atc ccc gta 144
 Leu Ala Trp Val Glu Asp His Gly Gly Leu Phe Asp Val Ile Pro Val
 35 40 45

ccg gtc gaa acc gtc gcc gag gac tgc ggc aac tcc gtc tcc acg gtg 192
 Pro Val Glu Thr Val Ala Glu Asp Cys Gly Asn Ser Val Ser Thr Val
 50 55 60

 cac gag gct ctc gcc cgc ctg gag gcc ctg aac ctc ctc gtg cgg acc 240
 His Glu Ala Leu Ala Arg Leu Glu Ala Leu Asn Leu Leu Val Arg Thr
 65 70 75 80

 tcc gcc ggc ctc tac cgg atc aac gcc cgg tac tac ttc acg ctg cac 288
 Ser Ala Gly Leu Tyr Arg Ile Asn Ala Arg Tyr Tyr Phe Thr Leu His
 85 90 95

 ccc gag ctg cgc gag atg atc acc gcc gcc ctc acg gac ccc ccg gtc 336
 Pro Glu Leu Arg Glu Met Ile Thr Ala Ala Leu Thr Asp Pro Pro Val
 100 105 110

 acc ccg gac gac cgt gcc cgc gcg ccc cgc aag gtc agc aac acc gac 384
 Thr Pro Asp Arg Ala Arg Ala Pro Arg Lys Val Ser Asn Thr Asp
 115 120 125

 gct cgc cgc cgc cgg acg atc cgc ccc gtc tct tga 420
 Ala Arg Arg Arg Arg Thr Ile Arg Pro Val Ser *
 130 135

<210> 66
 <211> 139
 <212> PRT
 <213> Bacteria

<400> 66
 Met Thr Thr Met Pro Val Glu Gly Phe Asn Pro Glu Arg Asp Leu Thr
 1 5 10 15
 Ala Pro Ser Leu Tyr Ser Leu Asn Leu Ser Ala Ala Gln His Cys Thr
 20 25 30
 Leu Ala Trp Val Glu Asp His Gly Gly Leu Phe Asp Val Ile Pro Val
 35 40 45
 Pro Val Glu Thr Val Ala Glu Asp Cys Gly Asn Ser Val Ser Thr Val
 50 55 60
 His Glu Ala Leu Ala Arg Leu Glu Ala Leu Asn Leu Leu Val Arg Thr
 65 70 75 80
 Ser Ala Gly Leu Tyr Arg Ile Asn Ala Arg Tyr Tyr Phe Thr Leu His
 85 90 95
 Pro Glu Leu Arg Glu Met Ile Thr Ala Ala Leu Thr Asp Pro Pro Val
 100 105 110
 Thr Pro Asp Asp Arg Ala Arg Ala Pro Arg Lys Val Ser Asn Thr Asp
 115 120 125
 Ala Arg Arg Arg Arg Thr Ile Arg Pro Val Ser
 130 135

<210> 67
 <211> 564
 <212> DNA
 <213> Bacteria

<220>

<221> CDS

<222> (1)...(564)

<400> 67

gtg	cca	gac	ggt	cag	ttg	ccg	ccc	tgt	acg	gga	gga	agc	tcg	aag	cct	48
Val	Pro	Asp	Gly	Gln	Leu	Pro	Pro	Cys	Thr	Gly	Gly	Ser	Ser	Lys	Pro	
1				5					10					15		

tca	ggc	tgc	tcg	tgt	cca	tcg	cca	acg	agc	gtc	tgc	gtc	acg	gcc	agg	96
Ser	Gly	Cys	Ser	Cys	Pro	Ser	Pro	Thr	Ser	Val	Cys	Val	Thr	Ala	Arg	
			20					25					30			

acg	tcg	ccc	ttc	gcg	tcg	tac	tgg	acg	gtc	cgg	tac	agc	atc	aca	ggc	144
Thr	Ser	Pro	Phe	Ala	Ser	Tyr	Trp	Thr	Val	Arg	Tyr	Ser	Ile	Thr	Gly	
		35					40					45				

ttg	ctc	gcg	gag	ggc	gga	agg	ccg	aag	tct	tcg	cac	tcg	aac	cag	gcg	192
Leu	Leu	Ala	Glu	Gly	Gly	Arg	Pro	Lys	Ser	Ser	His	Ser	Asn	Gln	Ala	
	50					55					60					

agc	atc	cga	gcg	gtc	agg	gtg	cgc	tcc	agc	cgg	acg	cac	ccc	gga	atc	240
Ser	Ile	Arg	Ala	Val	Arg	Val	Arg	Ser	Ser	Arg	Thr	His	Pro	Gly	Ile	
65					70					75					80	

gtg	ggg	gcc	aca	ggc	gtt	aga	gcc	agg	tcc	ggc	gag	acg	cgc	ggc	ggc	288
Val	Gly	Ala	Thr	Gly	Val	Arg	Ala	Arg	Ser	Gly	Glu	Thr	Arg	Gly	Gly	
				85					90					95		

ggg	atc	ggg	agc	cca	aga	cct	ggc	gca	agc	ctc	cgc	acc	gtc	tca	ctc	336
Gly	Ile	Gly	Ser	Pro	Arg	Pro	Gly	Ala	Ser	Leu	Arg	Thr	Val	Ser	Leu	
			100					105					110			

acg	acg	gcc	acc	ggg	tca	cca	agg	ctg	gtc	agg	tcg	aac	cac	tcg	ccc	384
Thr	Thr	Ala	Thr	Gly	Ser	Pro	Arg	Leu	Val	Arg	Ser	Asn	His	Ser	Pro	
		115					120					125				

cgc	cgg	ttg	tgc	tca	cgg	aac	tcc	tgg	tgg	agc	gcc	ccc	tca	agg	gcg	432
Arg	Arg	Leu	Cys	Ser	Arg	Asn	Ser	Trp	Trp	Ser	Ala	Pro	Ser	Arg	Ala	
	130					135					140					

cgg	ccg	ccc	tcg	cac	gtc	cac	agc	acc	gac	agc	gtc	agc	ggc	aga	ccg	480
Arg	Pro	Pro	Ser	His	Val	His	Ser	Thr	Asp	Ser	Val	Ser	Gly	Arg	Pro	
145					150					155				160		

gtc	tgc	atc	gtg	cgg	act	ctc	ctc	tcc	acg	tct	gtc	gtg	gtg	ccg	atc	528
Val	Cys	Ile	Val	Arg	Thr	Leu	Leu	Ser	Thr	Ser	Val	Val	Val	Pro	Ile	
				165					170					175		

ttc	acc	agg	tct	agg	ccc	tcg	gct	cct	aag	aga	tag					564
Phe	Thr	Arg	Ser	Arg	Pro	Ser	Ala	Pro	Lys	Arg	*					
			180					185								

<210> 68

<211> 187

Val	Pro	Asp	Gly	Gln	Leu	Pro	Pro	Cys	Thr	Gly	Gly	Ser	Ser	Lys	Pro
1				5					10					15	
Ser	Gly	Cys	Ser	Cys	Pro	Ser	Pro	Thr	Ser	Val	Cys	Val	Thr	Ala	Arg
			20					25					30		
Thr	Ser	Pro	Phe	Ala	Ser	Tyr	Trp	Thr	Val	Arg	Tyr	Ser	Ile	Thr	Gly
		35					40					45			
Leu	Leu	Ala	Glu	Gly	Gly	Arg	Pro	Lys	Ser	Ser	His	Ser	Asn	Gln	Ala
	50					55					60				
Ser	Ile	Arg	Ala	Val	Arg	Val	Arg	Ser	Ser	Arg	Thr	His	Pro	Gly	Ile
65					70					75				80	
Val	Gly	Ala	Thr	Gly	Val	Arg	Ala	Arg	Ser	Gly	Glu	Thr	Arg	Gly	Gly
				85					90					95	
Gly	Ile	Gly	Ser	Pro	Arg	Pro	Gly	Ala	Ser	Leu	Arg	Thr	Val	Ser	Leu
			100					105					110		
Thr	Thr	Ala	Thr	Gly	Ser	Pro	Arg	Leu	Val	Arg	Ser	Asn	His	Ser	Pro
		115					120					125			
Arg	Arg	Leu	Cys	Ser	Arg	Asn	Ser	Trp	Trp	Ser	Ala	Pro	Ser	Arg	Ala
	130					135					140				
Arg	Pro	Pro	Ser	His	Val	His	Ser	Thr	Asp	Ser	Val	Ser	Gly	Arg	Pro
145					150					155				160	
Val	Cys	Ile	Val	Arg	Thr	Leu	Leu	Ser	Thr	Ser	Val	Val	Val	Pro	Ile
				165					170					175	
Phe	Thr	Arg	Ser	Arg	Pro	Ser	Ala	Pro	Lys	Arg					
			180					185							

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<210> 69
<211> 798
<212> DNA
<213> Bacteria
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<220>
<221> CDS
<222> (1) ... (798)
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<400> 69																
atg	gcg	act	agg	cgg	aag	ggc	cgc	cct	ggc	ggc	tat	gag	gaa	atc	gcc	48
Met	Ala	Thr	Arg	Arg	Lys	Gly	Arg	Pro	Gly	Gly	Tyr	Glu	Glu	Ile	Ala	
1				5				10						15		
gcg	cac	ttt	cgg	cgg	ctc	atg	gac	tcg	ggc	gag	ttg	tcc	cct	ggc	gac	96
Ala	His	Phe	Arg	Arg	Leu	Met	Asp	Ser	Gly	Glu	Leu	Ser	Pro	Gly	Asp	
				20				25						30		
ccg	ctg	ccc	tcc	atg	cgc	gac	gtg	tgc	gac	cag	ttc	ggc	tcg	gcg	atc	144
Pro	Leu	Pro	Ser	Met	Arg	Asp	Val	Cys	Asp	Gln	Phe	Gly	Ser	Ala	Ile	
		35				40						45				
acg	acg	gtg	aac	cgg	gcg	ttc	cgg	ctc	ctc	cag	gag	gag	ggc	cgg	acg	192
Thr	Thr	Val	Asn	Arg	Ala	Phe	Arg	Leu	Leu	Gln	Glu	Glu	Gly	Arg	Thr	
50						55						60				

gtc tcc aag ccg ggc gtg ggc acg atc gtc cgg gac atg tcc cgg gtt	240
Val Ser Lys Pro Gly Val Gly Thr Ile Val Arg Asp Met Ser Arg Val	
65 70 75 80	
cgg gtg ccg ttc agt acg tac ggc gac gtc ctg gcg ccg ggc ggc gat	288
Arg Val Pro Phe Ser Thr Tyr Gly Asp Val Leu Ala Pro Gly Gly Asp	
85 90 95	
aag ggc ccg tgg gag cgt gcg acg gcc gcg cag ggc ctt gac ggc cgg	336
Lys Gly Pro Trp Glu Arg Ala Thr Ala Ala Gln Gly Leu Asp Gly Arg	
100 105 110	
atg ctc gtg gag gcg ccc gag gag gtc ggg gcc ccg gcg gac gtc gcc	384
Met Leu Val Glu Ala Pro Glu Glu Val Gly Ala Pro Ala Asp Val Ala	
115 120 125	
gcg cgc ctc ggc atc gag ccg ggc gcc ctg gtc gtc cac cgg cgg cgc	432
Ala Arg Leu Gly Ile Glu Pro Gly Ala Leu Val Val His Arg Arg Arg	
130 135 140	
cgc gcc acg atc ggc gag gac gtc gtc cag ctc caa gac gcc tgg tac	480
Arg Ala Thr Ile Gly Glu Asp Val Val Gln Leu Gln Asp Ala Trp Tyr	
145 150 155 160	
ccg ctg gag atc gcc cgg gcc gcc ggc ctg gac cgg ccg ggg aag gtc	528
Pro Leu Glu Ile Ala Arg Ala Ala Gly Leu Asp Arg Pro Gly Lys Val	
165 170 175	
gtg ggt ggt gtc ctc ggt gcc atg acg ggc gcc ggc ctt tcg ccg acg	576
Val Gly Gly Val Leu Gly Ala Met Thr Gly Ala Gly Leu Ser Pro Thr	
180 185 190	
tcc acc gac cac gac gtc gag gtg tgg gtg ccg tcc gcg cag caa gcc	624
Ser Thr Asp His Asp Val Glu Val Trp Val Pro Ser Ala Gln Gln Ala	
195 200 205	
gcg gaa ctc tcc ctc ggc tcc cgc gtg tcg gtc ctg gtc gtc gag cgc	672
Ala Glu Leu Ser Leu Gly Ser Arg Val Ser Val Leu Val Val Glu Arg	
210 215 220	
gtc acc tac gac gcg acg gtc cgt gtc ctg gaa ctg acc cgt cac acg	720
Val Thr Tyr Asp Ala Thr Val Arg Val Leu Glu Leu Thr Arg His Thr	
225 230 235 240	
ggc gcg gct gac agg ctg acg ctg acc tac aag ggc ctg cca ctc cgg	768
Gly Ala Ala Asp Arg Leu Thr Leu Thr Tyr Lys Gly Leu Pro Leu Arg	
245 250 255	
gcg acc gga gcc gag ggg agc acg tca tga	798
Ala Thr Gly Ala Glu Gly Ser Thr Ser *	
260 265	

<210> 70
 <211> 265
 <212> PRT

<213> Bacteria

<400> 70

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Met Ala Thr Arg Arg Lys Gly Arg Pro Gly Gly Tyr Glu Glu Ile Ala
 1              5              10              15
Ala His Phe Arg Arg Leu Met Asp Ser Gly Glu Leu Ser Pro Gly Asp
      20              25              30
Pro Leu Pro Ser Met Arg Asp Val Cys Asp Gln Phe Gly Ser Ala Ile
      35              40              45
Thr Thr Val Asn Arg Ala Phe Arg Leu Leu Gln Glu Glu Gly Arg Thr
      50              55              60
Val Ser Lys Pro Gly Val Gly Thr Ile Val Arg Asp Met Ser Arg Val
65              70              75              80
Arg Val Pro Phe Ser Thr Tyr Gly Asp Val Leu Ala Pro Gly Gly Asp
      85              90              95
Lys Gly Pro Trp Glu Arg Ala Thr Ala Ala Gln Gly Leu Asp Gly Arg
      100             105             110
Met Leu Val Glu Ala Pro Glu Glu Val Gly Ala Pro Ala Asp Val Ala
      115             120             125
Ala Arg Leu Gly Ile Glu Pro Gly Ala Leu Val Val His Arg Arg Arg
      130             135             140
Arg Ala Thr Ile Gly Glu Asp Val Val Gln Leu Gln Asp Ala Trp Tyr
145             150             155             160
Pro Leu Glu Ile Ala Arg Ala Ala Gly Leu Asp Arg Pro Gly Lys Val
      165             170             175
Val Gly Gly Val Leu Gly Ala Met Thr Gly Ala Gly Leu Ser Pro Thr
      180             185             190
Ser Thr Asp His Asp Val Glu Val Trp Val Pro Ser Ala Gln Gln Ala
      195             200             205
Ala Glu Leu Ser Leu Gly Ser Arg Val Ser Val Leu Val Val Glu Arg
      210             215             220
Val Thr Tyr Asp Ala Thr Val Arg Val Leu Glu Leu Thr Arg His Thr
225             230             235             240
Gly Ala Ala Asp Arg Leu Thr Leu Thr Tyr Lys Gly Leu Pro Leu Arg
      245             250             255
Ala Thr Gly Ala Glu Gly Ser Thr Ser
      260             265
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<210> 71

<211> 378

<212> DNA

<213> Bacteria

<220>

<221> CDS

<222> (1)...(378)

<400> 71

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atg tcc acg acc acc aac gcg gtc acc tgg ttc gag gtc ggc acc gac   48
Met Ser Thr Thr Thr Asn Ala Val Thr Trp Phe Glu Val Gly Thr Asp
 1              5              10              15

cgg ccg gag gag acc ggg cgc ttc tac gcc gac ctg ttc ggt tgg gcg   96
Arg Pro Glu Glu Thr Gly Arg Phe Tyr Ala Asp Leu Phe Gly Trp Ala
      20              25              30
```

ttc ggc gag cag ggg acg ccg gag gcg tcg tac cgg gtg acg gag ccg	144
Phe Gly Glu Gln Gly Thr Pro Glu Ala Ser Tyr Arg Val Thr Glu Pro	
35 40 45	
ggg ccg gag ggc tcg atc cag ggc gcg atc cgg ggc acc ggc ggg gcg	192
Gly Pro Glu Gly Ser Ile Gln Gly Ala Ile Arg Gly Thr Gly Gly Ala	
50 55 60	
agc ccg aac tac gcc atc ttc tac gtg cag gtg gcc gac gtg gcg gac	240
Ser Pro Asn Tyr Ala Ile Phe Tyr Val Gln Val Ala Asp Val Ala Asp	
65 70 75 80	
gcc tgc cgg cgc gcg gag gcg gcc ggt ggc aag gtg ctg gtg ccg gcg	288
Ala Cys Arg Arg Ala Glu Ala Ala Gly Gly Lys Val Leu Val Pro Ala	
85 90 95	
aag tcc acc gac aac ggg ctc acc ttc gcc cac ctg ctc gac ccg gtc	336
Lys Ser Thr Asp Asn Gly Leu Thr Phe Ala His Leu Leu Asp Pro Val	
100 105 110	
ggc aac cac ttc ggc gtc ttc gcc ccg ccg ccg gcc gcc tga	378
Gly Asn His Phe Gly Val Phe Ala Pro Pro Pro Ala Ala *	
115 120 125	

<210> 72
 <211> 125
 <212> PRT
 <213> Bacteria

<400> 72	
Met Ser Thr Thr Thr Asn Ala Val Thr Trp Phe Glu Val Gly Thr Asp	
1 5 10 15	
Arg Pro Glu Glu Thr Gly Arg Phe Tyr Ala Asp Leu Phe Gly Trp Ala	
20 25 30	
Phe Gly Glu Gln Gly Thr Pro Glu Ala Ser Tyr Arg Val Thr Glu Pro	
35 40 45	
Gly Pro Glu Gly Ser Ile Gln Gly Ala Ile Arg Gly Thr Gly Gly Ala	
50 55 60	
Ser Pro Asn Tyr Ala Ile Phe Tyr Val Gln Val Ala Asp Val Ala Asp	
65 70 75 80	
Ala Cys Arg Arg Ala Glu Ala Ala Gly Gly Lys Val Leu Val Pro Ala	
85 90 95	
Lys Ser Thr Asp Asn Gly Leu Thr Phe Ala His Leu Leu Asp Pro Val	
100 105 110	
Gly Asn His Phe Gly Val Phe Ala Pro Pro Pro Ala Ala	
115 120 125	

<210> 73
 <211> 741
 <212> DNA
 <213> Bacteria

<220>

<221> CDS

<222> (1)...(741)

<400> 73

gtg	cgg	cga	cgg	cct	gaa	tcg	tgg	ggc	cgg	aag	ccg	gag	ccg	ccg	tcc	48
Val	Arg	Arg	Arg	Pro	Glu	Ser	Trp	Gly	Arg	Lys	Pro	Glu	Pro	Pro	Ser	
1				5				10						15		
gcc	ccg	gcg	agg	ttg	ccg	ggg	cgg	acg	gcg	tac	ggg	cac	ttg	ccg	gcc	96
Ala	Pro	Ala	Arg	Leu	Pro	Gly	Arg	Thr	Ala	Tyr	Gly	His	Leu	Pro	Ala	
			20					25					30			
gag	cct	ccg	cga	ccg	ccc	ggg	ccg	gcc	agg	acg	ccg	gcc	tcg	gcg	gcc	144
Glu	Pro	Pro	Arg	Pro	Pro	Gly	Pro	Ala	Arg	Thr	Pro	Ala	Ser	Ala	Ala	
		35					40					45				
gcg	gtg	atc	gcg	tcc	gcc	tgc	tcc	tgg	gtg	agc	ttg	ccg	tcc	tcg	acc	192
Ala	Val	Ile	Ala	Ser	Ala	Cys	Ser	Trp	Val	Ser	Leu	Pro	Ser	Ser	Thr	
	50					55					60					
gcc	tgc	gcc	agg	cgc	tcc	ttc	agc	gcg	gcc	tgc	cgg	tcg	gcg	gag	tca	240
Ala	Cys	Ala	Arg	Arg	Ser	Phe	Ser	Ala	Ala	Cys	Arg	Ser	Ala	Glu	Ser	
	65				70					75				80		
ccc	cgc	tcg	ggc	cgg	tcg	gcc	ggc	ttc	tgc	gcc	tcg	cgc	acc	ttc	tcc	288
Pro	Arg	Ser	Gly	Arg	Ser	Ala	Gly	Phe	Cys	Ala	Ser	Arg	Thr	Phe	Ser	
			85					90						95		
agc	gcg	gcc	gtc	acc	ttg	tcg	gtg	tcg	acg	ccc	agc	tcc	ttg	gcc	agg	336
Ser	Ala	Ala	Val	Thr	Leu	Ser	Val	Ser	Thr	Pro	Ser	Ser	Leu	Ala	Arg	
			100					105					110			
gcc	tcg	gcg	aac	tcc	gcc	tgc	cgc	tcg	gcc	cgc	tgc	tgc	tgc	cgc	tcg	384
Ala	Ser	Ala	Asn	Ser	Ala	Cys	Arg	Ser	Ala	Arg	Cys	Cys	Cys	Arg	Ser	
		115					120					125				
tca	ctg	ctg	ctg	ccg	ctc	tcg	ctc	gcg	ctg	gcg	ctc	ggc	gtc	gcg	gtg	432
Ser	Leu	Leu	Leu	Pro	Leu	Ser	Leu	Ala	Leu	Ala	Leu	Gly	Val	Ala	Val	
	130						135					140				
ccg	ccg	tcc	gcg	gcg	aac	gcg	acc	gtc	ggc	gcc	gcg	atc	ccc	acg	ccg	480
Pro	Pro	Ser	Ala	Ala	Asn	Ala	Thr	Val	Gly	Ala	Ala	Ile	Pro	Thr	Pro	
	145				150					155				160		
aga	acc	ccg	gcc	gcg	gcc	agg	ccg	gcc	agc	agg	tgc	ttc	ttc	ttc	atg	528
Arg	Thr	Pro	Ala	Ala	Ala	Arg	Pro	Ala	Ser	Arg	Cys	Phe	Phe	Phe	Met	
			165					170						175		
gtg	ccg	gac	atg	ctg	tcc	tcc	gtc	gga	tcg	gtg	gtt	ggg	gcg	atg	acc	576
Val	Pro	Asp	Met	Leu	Ser	Ser	Val	Gly	Ser	Val	Val	Gly	Ala	Met	Thr	
			180					185					190			
tca	ccc	gac	ggg	gac	cag	ccc	ggc	tgg	ggg	aaa	gcc	gtg	gtg	aac	ctg	624
Ser	Pro	Asp	Gly	Asp	Gln	Pro	Gly	Trp	Gly	Lys	Ala	Val	Val	Asn	Leu	
		195					200					205				

tca gcg agc tgg caa tcc gcc cgc cgc gcc gga caa acg ggt tgc cgg 672
 Ser Ala Ser Trp Gln Ser Ala Arg Arg Ala Gly Gln Thr Gly Cys Arg
 210 215 220

ggc gcc cgc cgc cgg tca ggg ttg gtg gtc ggc agg ccc cac cgg ggc 720
 Gly Ala Arg Arg Arg Ser Gly Leu Val Val Gly Arg Pro His Arg Gly
 225 230 235 240

gga gca gac gac gga agg tga 741
 Gly Ala Asp Asp Gly Arg *
 245

<210> 74
 <211> 246
 <212> PRT
 <213> Bacteria

<400> 74
 Val Arg Arg Arg Pro Glu Ser Trp Gly Arg Lys Pro Glu Pro Pro Ser
 1 5 10 15
 Ala Pro Ala Arg Leu Pro Gly Arg Thr Ala Tyr Gly His Leu Pro Ala
 20 25 30
 Glu Pro Pro Arg Pro Pro Gly Pro Ala Arg Thr Pro Ala Ser Ala Ala
 35 40 45
 Ala Val Ile Ala Ser Ala Cys Ser Trp Val Ser Leu Pro Ser Ser Thr
 50 55 60
 Ala Cys Ala Arg Arg Ser Phe Ser Ala Ala Cys Arg Ser Ala Glu Ser
 65 70 75 80
 Pro Arg Ser Gly Arg Ser Ala Gly Phe Cys Ala Ser Arg Thr Phe Ser
 85 90 95
 Ser Ala Ala Val Thr Leu Ser Val Ser Thr Pro Ser Ser Leu Ala Arg
 100 105 110
 Ala Ser Ala Asn Ser Ala Cys Arg Ser Ala Arg Cys Cys Cys Arg Ser
 115 120 125
 Ser Leu Leu Leu Pro Leu Ser Leu Ala Leu Ala Leu Gly Val Ala Val
 130 135 140
 Pro Pro Ser Ala Ala Asn Ala Thr Val Gly Ala Ala Ile Pro Thr Pro
 145 150 155 160
 Arg Thr Pro Ala Ala Ala Arg Pro Ala Ser Arg Cys Phe Phe Phe Met
 165 170 175
 Val Pro Asp Met Leu Ser Ser Val Gly Ser Val Val Gly Ala Met Thr
 180 185 190
 Ser Pro Asp Gly Asp Gln Pro Gly Trp Gly Lys Ala Val Val Asn Leu
 195 200 205
 Ser Ala Ser Trp Gln Ser Ala Arg Arg Ala Gly Gln Thr Gly Cys Arg
 210 215 220
 Gly Ala Arg Arg Arg Ser Gly Leu Val Val Gly Arg Pro His Arg Gly
 225 230 235 240
 Gly Ala Asp Asp Gly Arg
 245

<210> 75
 <211> 891

<212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(891)

<400> 75

gtg atc ctc gtg gcg ttg gcg aag atc cgg gaa gtc ccg ctc acc ggg	48
Val Ile Leu Val Ala Leu Ala Lys Ile Arg Glu Val Pro Leu Thr Gly	
1 5 10 15	
gcg gac gcc ggc ccg tac ggc gtc acc gtc ggc ccc gac ggc gcg ctc	96
Ala Asp Ala Gly Pro Tyr Gly Val Thr Val Gly Pro Asp Gly Ala Leu	
20 25 30	
tgg ctg acg ctg gtc cac gcc ggc gcg gtc gcc cgg gtg ggc gcg gac	144
Trp Leu Thr Leu Val His Ala Gly Ala Val Ala Arg Val Gly Ala Asp	
35 40 45	
ggc gac ctg cgc acc tgg cag gtg gcg gcc gac agc cgg ccg ctg atc	192
Gly Asp Leu Arg Thr Trp Gln Val Ala Ala Asp Ser Arg Pro Leu Ile	
50 55 60	
gtc acg ccg ggc ccc gac ggc gcc ctc tgg ttc acc cgc tcc ggc gac	240
Val Thr Pro Gly Pro Asp Gly Ala Leu Trp Phe Thr Arg Ser Gly Asp	
65 70 75 80	
gac cgg atc ggc cgg atc acc acc gac ggg gag cag agc gcc gtc gcg	288
Asp Arg Ile Gly Arg Ile Thr Thr Asp Gly Glu Gln Ser Ala Val Ala	
85 90 95	
ctc ccg ccc ggg agc ggc ccc tgc ggc atc gcc gcc ggt ccc gac ggc	336
Leu Pro Pro Gly Ser Gly Pro Cys Gly Ile Ala Ala Gly Pro Asp Gly	
100 105 110	
gcc ctc tgg tac gcg gcg atg acc gcc gac gcg gtc ggc cgc gtc acc	384
Ala Leu Trp Tyr Ala Ala Met Thr Ala Asp Ala Val Gly Arg Val Thr	
115 120 125	
acc gac ggg aag gtg acg cag ttt ccg ctg ccg gtg agc ggc ggc ttc	432
Thr Asp Gly Lys Val Thr Gln Phe Pro Leu Pro Val Ser Gly Gly Phe	
130 135 140	
gcc tcg atg gtc gcc gcc ggc ccg gac gag gcc gtc tgg ttc acg ctc	480
Ala Ser Met Val Ala Ala Gly Pro Asp Glu Ala Val Trp Phe Thr Leu	
145 150 155 160	
aac cag gcg aac gcg gtc ggc cgg atc ggc acg gac ggc gcg gtg gcg	528
Asn Gln Ala Asn Ala Val Gly Arg Ile Gly Thr Asp Gly Ala Val Ala	
165 170 175	
ctg cac cca ctg ccg acc gag ggc gcc gcc ccg gtg ggc atc acg gcc	576
Leu His Pro Leu Pro Thr Glu Gly Ala Ala Pro Val Gly Ile Thr Ala	
180 185 190	

gga gcg gac ggc gcg ctc tgg ttc gtc gag atc ggc gcc ggc cag ctc 624
 Gly Ala Asp Gly Ala Leu Trp Phe Val Glu Ile Gly Ala Gly Gln Leu
 195 200 205
 ggc cgg atc acc ccg gac ggg cgg atc gac gag tac ccg ctg ccg gac 672
 Gly Arg Ile Thr Pro Asp Gly Arg Ile Asp Glu Tyr Pro Leu Pro Asp
 210 215 220
 cgg gcg gcc cgg ccg cac gcg atc gtc gcc gac ccg gcg ggc ggc tgc 720
 Arg Ala Ala Arg Pro His Ala Ile Val Ala Asp Pro Ala Gly Gly Cys
 225 230 235 240
 tgg ttc acc gag tgg ggc ggc aac cgg atc ggc cac gtc gcc ccg gac 768
 Trp Phe Thr Glu Trp Gly Gly Asn Arg Ile Gly His Val Ala Pro Asp
 245 250 255
 ggc acg atc gtc acc cac gac ctt ccg acc ccg gcc gcc gag ccg cac 816
 Gly Thr Ile Val Thr His Asp Leu Pro Thr Pro Ala Ala Glu Pro His
 260 265 270
 ggc atc acc gtc gcc ccc gac ggc acg gtc tgg gcc gcc ctg gaa acg 864
 Gly Ile Thr Val Ala Pro Asp Gly Thr Val Trp Ala Ala Leu Glu Thr
 275 280 285
 ggc gct ctg gcc cac ctg acg ccc tga 891
 Gly Ala Leu Ala His Leu Thr Pro *
 290 295

<210> 76
 <211> 125
 <212> PRT
 <213> Bacteria

<400> 76
 Met Ser Thr Thr Thr Asn Ala Val Thr Trp Phe Glu Val Gly Thr Asp
 1 5 10 15
 Arg Pro Glu Glu Thr Gly Arg Phe Tyr Ala Asp Leu Phe Gly Trp Ala
 20 25 30
 Phe Gly Glu Gln Gly Thr Pro Glu Ala Ser Tyr Arg Val Thr Glu Pro
 35 40 45
 Gly Pro Glu Gly Ser Ile Gln Gly Ala Ile Arg Gly Thr Gly Gly Ala
 50 55 60
 Ser Pro Asn Tyr Ala Ile Phe Tyr Val Gln Val Ala Asp Val Ala Asp
 65 70 75 80
 Ala Cys Arg Arg Ala Glu Ala Ala Gly Gly Lys Val Leu Val Pro Ala
 85 90 95
 Lys Ser Thr Asp Asn Gly Leu Thr Phe Ala His Leu Leu Asp Pro Val
 100 105 110
 Gly Asn His Phe Gly Val Phe Ala Pro Pro Pro Ala Ala
 115 120 125

<210> 77
 <211> 1086
 <212> DNA

<213> Bacteria

<220>

<221> CDS

<222> (1)...(1086)

<400> 77

gtg acc gcg gcg ggc ccc gag cgc ctc cac cgg cgc ggc ggc ggc ctc	48
Val Thr Ala Ala Gly Pro Glu Arg Leu His Arg Arg Gly Gly Gly Leu	
1 5 10 15	
ccc cgg ccg acc gga gca ggc gtc cca cgc tcg gcg gag tgg gcc gac	96
Pro Arg Pro Thr Gly Ala Gly Val Pro Arg Ser Ala Glu Trp Ala Asp	
20 25 30	
cgg tac gtg ggc ggc gcc ccg ccg cga cta ggc tct gcc gct gtg tcc	144
Arg Tyr Val Gly Gly Ala Pro Pro Arg Leu Gly Ser Ala Ala Val Ser	
35 40 45	
gac cat gcc agc acg act ccc gcc acc gcc gta cga ccg ccg gtg ctg	192
Asp His Ala Ser Thr Thr Pro Ala Thr Ala Val Arg Pro Pro Val Leu	
50 55 60	
tgc ccc ggc gac acg gtg atg ctg gtg tcg ccg tcg ggg ccg acc cgg	240
Cys Pro Gly Asp Thr Val Met Leu Val Ser Pro Ser Gly Pro Thr Arg	
65 70 75 80	
ccc gag cgg gtg gcc cgg ggc atc gag ctg ctc acc ggc tgg ggg ctg	288
Pro Glu Arg Val Ala Arg Gly Ile Glu Leu Leu Thr Gly Trp Gly Leu	
85 90 95	
cgg ccg gtg ctg gcg ccg aac gcg tac gcc cgg cag ggt tac ctg gcc	336
Arg Pro Val Leu Ala Pro Asn Ala Tyr Ala Arg Gln Gly Tyr Leu Ala	
100 105 110	
ggc gcg gac gag ctg cgc gcc gcc gac ctg aac gcg gcg ttc gcc gac	384
Gly Ala Asp Glu Leu Arg Ala Ala Asp Leu Asn Ala Ala Phe Ala Asp	
115 120 125	
ccc gag gtg cgc ggg gtg atc tgc acg cgc ggc ggg tac ggc gcg cag	432
Pro Glu Val Arg Gly Val Ile Cys Thr Arg Gly Gly Tyr Gly Ala Gln	
130 135 140	
cgg atc gtc gac gcg atc gac atg gcc gcc gta cgc cgg gac ccg aag	480
Arg Ile Val Asp Ala Ile Asp Met Ala Ala Val Arg Arg Asp Pro Lys	
145 150 155 160	
gtg gtc gcc ggg ttc tcc gac atc acc gcg ctg cag ctc gcg ctg tgg	528
Val Val Ala Gly Phe Ser Asp Ile Thr Ala Leu Gln Leu Ala Leu Trp	
165 170 175	
cgg ggc gcc cgg ctg gcc ggc gtg cac ggc ccc ggg gcg gcg tgg ctg	576
Arg Gly Ala Arg Leu Ala Gly Val His Gly Pro Gly Ala Ala Trp Leu	
180 185 190	
gac gag cgc act ccg ctg cgg tcg gcc gag tcg ctg cac gcc gcc ctg	624

Asp	Glu	Arg	Thr	Pro	Leu	Arg	Ser	Ala	Glu	Ser	Leu	His	Ala	Ala	Leu		
		195					200					205					
atg	acc	acc	gaa	ccg	gtg	acg	gtg	acc	gcc	gtc	gcc	gag	gag	gag	acg	672	
Met	Thr	Thr	Glu	Pro	Val	Thr	Val	Thr	Ala	Val	Ala	Glu	Glu	Glu	Thr		
		210				215					220						
ttc	ccg	gtg	cgg	gtg	ccc	ggg	cgg	gcc	acc	ggc	ccg	ctg	ctg	ggc	ggc	720	
Phe	Pro	Val	Arg	Val	Pro	Gly	Arg	Ala	Thr	Gly	Pro	Leu	Leu	Gly	Gly		
225					230					235					240		
aac	ctc	tgc	ctg	gtc	gtg	gcg	tcg	ctg	ggc	acc	ccg	gac	atg	ccg	gac	768	
Asn	Leu	Cys	Leu	Val	Val	Ala	Ser	Leu	Gly	Thr	Pro	Asp	Met	Pro	Asp		
			245						250					255			
ctg	acc	ggc	gcg	atc	ctg	ttg	atc	gag	gac	gtg	cag	gag	ccg	ccg	tac	816	
Leu	Thr	Gly	Ala	Ile	Leu	Leu	Ile	Glu	Asp	Val	Gln	Glu	Pro	Pro	Tyr		
			260					265					270				
aag	gtg	gac	cgg	atg	ctc	acc	cag	ttg	cgc	cgg	gcc	ggc	gcg	ctg	gac	864	
Lys	Val	Asp	Arg	Met	Leu	Thr	Gln	Leu	Arg	Arg	Ala	Gly	Ala	Leu	Asp		
		275					280					285					
ggg	ctg	gcc	ggg	gtg	gcg	gtc	ggc	cag	ttc	acc	ggc	tgc	gcc	gac	ggc	912	
Gly	Leu	Ala	Gly	Val	Ala	Val	Gly	Gln	Phe	Thr	Gly	Cys	Ala	Asp	Gly		
		290				295					300						
tgg	tcg	acc	agc	gtc	gcc	gac	gtg	ctc	tcc	gag	cgc	ctc	ggc	gac	ctc	960	
Trp	Ser	Thr	Ser	Val	Ala	Asp	Val	Leu	Ser	Glu	Arg	Leu	Gly	Asp	Leu		
305					310					315					320		
ggc	gtc	ccg	gtc	ctc	ggc	ggc	ctg	ccc	gtc	ggc	cac	ggc	gtc	ggc	cag	1008	
Gly	Val	Pro	Val	Leu	Gly	Gly	Leu	Pro	Val	Gly	His	Gly	Val	Gly	Gln		
				325					330					335			
ctc	acc	gtc	ccg	gtc	ggc	acc	gac	gcg	acc	ctc	gac	acg	acg	acg	gcc	1056	
Leu	Thr	Val	Pro	Val	Gly	Thr	Asp	Ala	Thr	Leu	Asp	Thr	Thr	Thr	Ala		
			340					345					350				
acc	ctc	acg	gtc	acc	ccc	gcc	gtc	cgc	tga							1086	
Thr	Leu	Thr	Val	Thr	Pro	Ala	Val	Arg	*								
		355					360										

<210> 78
 <211> 361
 <212> PRT
 <213> Bacteria

<400> 78
 Val Thr Ala Ala Gly Pro Glu Arg Leu His Arg Arg Gly Gly Gly Leu
 1 5 10 15
 Pro Arg Pro Thr Gly Ala Gly Val Pro Arg Ser Ala Glu Trp Ala Asp
 20 25 30
 Arg Tyr Val Gly Gly Ala Pro Pro Arg Leu Gly Ser Ala Ala Val Ser
 35 40 45

Asp His Ala Ser Thr Thr Pro Ala Thr Ala Val Arg Pro Pro Val Leu
 50 55 60
 Cys Pro Gly Asp Thr Val Met Leu Val Ser Pro Ser Gly Pro Thr Arg
 65 70 75 80
 Pro Glu Arg Val Ala Arg Gly Ile Glu Leu Thr Gly Trp Gly Leu
 85 90 95
 Arg Pro Val Leu Ala Pro Asn Ala Tyr Ala Arg Gln Gly Tyr Leu Ala
 100 105 110
 Gly Ala Asp Glu Leu Arg Ala Ala Asp Leu Asn Ala Ala Phe Ala Asp
 115 120 125
 Pro Glu Val Arg Gly Val Ile Cys Thr Arg Gly Gly Tyr Gly Ala Gln
 130 135 140
 Arg Ile Val Asp Ala Ile Asp Met Ala Ala Val Arg Arg Asp Pro Lys
 145 150 155 160
 Val Val Ala Gly Phe Ser Asp Ile Thr Ala Leu Gln Leu Ala Leu Trp
 165 170 175
 Arg Gly Ala Arg Leu Ala Gly Val His Gly Pro Gly Ala Ala Trp Leu
 180 185 190
 Asp Glu Arg Thr Pro Leu Arg Ser Ala Glu Ser Leu His Ala Ala Leu
 195 200 205
 Met Thr Thr Glu Pro Val Thr Val Thr Ala Val Ala Glu Glu Glu Thr
 210 215 220
 Phe Pro Val Arg Val Pro Gly Arg Ala Thr Gly Pro Leu Leu Gly Gly
 225 230 235 240
 Asn Leu Cys Leu Val Val Ala Ser Leu Gly Thr Pro Asp Met Pro Asp
 245 250 255
 Leu Thr Gly Ala Ile Leu Leu Ile Glu Asp Val Gln Glu Pro Pro Tyr
 260 265 270
 Lys Val Asp Arg Met Leu Thr Gln Leu Arg Arg Ala Gly Ala Leu Asp
 275 280 285
 Gly Leu Ala Gly Val Ala Val Gly Gln Phe Thr Gly Cys Ala Asp Gly
 290 295 300
 Trp Ser Thr Ser Val Ala Asp Val Leu Ser Glu Arg Leu Gly Asp Leu
 305 310 315 320
 Gly Val Pro Val Leu Gly Gly Leu Pro Val Gly His Gly Val Gly Gln
 325 330 335
 Leu Thr Val Pro Val Gly Thr Asp Ala Thr Leu Asp Thr Thr Thr Ala
 340 345 350
 Thr Leu Thr Val Thr Pro Ala Val Arg
 355 360

<210> 79
 <211> 861
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(861)

<400> 79
 gtg gga cgc ctg ctc cgg tcg gcc ggg gga ggc cgc cgc cgc gcc ggt 48
 Val Gly Arg Leu Leu Arg Ser Ala Gly Gly Gly Arg Arg Arg Ala Gly
 1 5 10 15

gga ggc gct cgg ggc ccg ccg cgg tca ccg gct agc ctc gac gtc gtg	96
Gly Gly Ala Arg Gly Pro Pro Arg Ser Pro Ala Ser Leu Asp Val Val	
20 25 30	
gct acc gcg ttg gtg atc gag aac gac ccg acc gac gac gtc cgc cgg	144
Ala Thr Ala Leu Val Ile Glu Asn Asp Pro Thr Asp Asp Val Arg Arg	
35 40 45	
ctc ggc gag tgg ctg acc gag gcg ggt ctc gac ctg tgg gtc gtc cgc	192
Leu Gly Glu Trp Leu Thr Glu Ala Gly Leu Asp Leu Trp Val Val Arg	
50 55 60	
gcg cac gcc ggc gat cag ctc ccc gcc gac ctg gag ggc tac tcc gcg	240
Ala His Ala Gly Asp Gln Leu Pro Ala Asp Leu Glu Gly Tyr Ser Ala	
65 70 75 80	
ctg gtg gtg ctg ggc ggc gag cag cag gcg tac ccg ctg ccc gac ggc	288
Leu Val Val Leu Gly Gly Glu Gln Gln Ala Tyr Pro Leu Pro Asp Gly	
85 90 95	
tcg ccc ggc gcg ccc tgg ttc ccc gcc gtc gag ggg ctg ctc cgc aag	336
Ser Pro Gly Ala Pro Trp Phe Pro Ala Val Glu Gly Leu Leu Arg Lys	
100 105 110	
gcc gtc cgg gac cgg gtg ccc acc ctg ggc atc tgc ctg ggc gcg cag	384
Ala Val Arg Asp Arg Val Pro Thr Leu Gly Ile Cys Leu Gly Ala Gln	
115 120 125	
ttg ctg gcg acc gcc cac gcc ggc gag gtc gag cgc agc gcg tcc ggg	432
Leu Leu Ala Thr Ala His Ala Gly Glu Val Glu Arg Ser Ala Ser Gly	
130 135 140	
ccg gag gtc ggg ccc ggt gtg gtc ggc aag ccg gac gcc gcc gac gcc	480
Pro Glu Val Gly Pro Gly Val Val Gly Lys Arg Asp Ala Ala Asp Ala	
145 150 155 160	
gac ccg ctg ttc cgc tac gtc ccg ctg atc ccc gac gtg ctc cag tgg	528
Asp Pro Leu Phe Arg Tyr Val Pro Leu Ile Pro Asp Val Leu Gln Trp	
165 170 175	
cac gcc gac gag atc acc gag ctg ccc ccg ggc gcc acc ctg ctg gcc	576
His Ala Asp Glu Ile Thr Glu Leu Pro Arg Gly Ala Thr Leu Leu Ala	
180 185 190	
gcc tcc acc cgc tac ccg cac cag gcg ttc cgc ctc ggc gac ccg gcc	624
Ala Ser Thr Arg Tyr Pro His Gln Ala Phe Arg Leu Gly Asp Arg Ala	
195 200 205	
tgg ggg ctg cag ttc cac atc gag tgc gac acc gcg atg atc gcc gac	672
Trp Gly Leu Gln Phe His Ile Glu Cys Asp Thr Ala Met Ile Ala Asp	
210 215 220	
tgg gcc acc gac tcg acg ctg ctg gcc gag ctg ggc tac gac ccg gac	720
Trp Ala Thr Asp Ser Thr Leu Leu Ala Glu Leu Gly Tyr Asp Pro Asp	
225 230 235 240	

ctg gtg gtg gcg gcc tgc cac gcg gtg atg gtc gac gtc gag gag gtc	768
Leu Val Val Ala Ala Cys His Ala Val Met Val Asp Val Glu Glu Val	
245 250 255	
tgg cag ccg ttc gcc gcc cgg ttc gcc gcg ctg gct ctc ggc gag ctg	816
Trp Gln Pro Phe Ala Ala Arg Phe Ala Ala Leu Ala Leu Gly Glu Leu	
260 265 270	
gac gac gac acg tcc cgc cgc agc ctg ccg ctg ctc ggg cag tga	861
Asp Asp Asp Thr Ser Arg Arg Ser Leu Pro Leu Leu Gly Gln *	
275 280 285	

<210> 80
 <211> 286
 <212> PRT
 <213> Bacteria

<400> 80

Val Gly Arg Leu Leu Arg Ser Ala Gly Gly Gly Arg Arg Arg Ala Gly	
1 5 10 15	
Gly Gly Ala Arg Gly Pro Pro Arg Ser Pro Ala Ser Leu Asp Val Val	
20 25 30	
Ala Thr Ala Leu Val Ile Glu Asn Asp Pro Thr Asp Asp Val Arg Arg	
35 40 45	
Leu Gly Glu Trp Leu Thr Glu Ala Gly Leu Asp Leu Trp Val Val Arg	
50 55 60	
Ala His Ala Gly Asp Gln Leu Pro Ala Asp Leu Glu Gly Tyr Ser Ala	
65 70 75 80	
Leu Val Val Leu Gly Gly Glu Gln Gln Ala Tyr Pro Leu Pro Asp Gly	
85 90 95	
Ser Pro Gly Ala Pro Trp Phe Pro Ala Val Glu Gly Leu Leu Arg Lys	
100 105 110	
Ala Val Arg Asp Arg Val Pro Thr Leu Gly Ile Cys Leu Gly Ala Gln	
115 120 125	
Leu Leu Ala Thr Ala His Ala Gly Glu Val Glu Arg Ser Ala Ser Gly	
130 135 140	
Pro Glu Val Gly Pro Gly Val Val Gly Lys Arg Asp Ala Ala Asp Ala	
145 150 155 160	
Asp Pro Leu Phe Arg Tyr Val Pro Leu Ile Pro Asp Val Leu Gln Trp	
165 170 175	
His Ala Asp Glu Ile Thr Glu Leu Pro Arg Gly Ala Thr Leu Leu Ala	
180 185 190	
Ala Ser Thr Arg Tyr Pro His Gln Ala Phe Arg Leu Gly Asp Arg Ala	
195 200 205	
Trp Gly Leu Gln Phe His Ile Glu Cys Asp Thr Ala Met Ile Ala Asp	
210 215 220	
Trp Ala Thr Asp Ser Thr Leu Leu Ala Glu Leu Gly Tyr Asp Pro Asp	
225 230 235 240	
Leu Val Val Ala Ala Cys His Ala Val Met Val Asp Val Glu Glu Val	
245 250 255	
Trp Gln Pro Phe Ala Ala Arg Phe Ala Ala Leu Ala Leu Gly Glu Leu	
260 265 270	
Asp Asp Asp Thr Ser Arg Arg Ser Leu Pro Leu Leu Gly Gln	
275 280 285	

<210> 81
 <211> 3033
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(3033)

<400> 81

gtg atg agc cgg ccg acc agc gcc gcc gga cgg ctc gcc cgc tac ggt	48
Val Met Ser Arg Pro Thr Ser Ala Ala Gly Arg Leu Ala Arg Tyr Gly	
1 5 10 15	
ttc ggc atc gtc ggc ggc gac ggc gcc acc cgc gcc gcc gac ctg ctc	96
Phe Gly Ile Val Gly Gly Asp Gly Ala Thr Arg Ala Ala Asp Leu Leu	
20 25 30	
ggc ccc gac ggg ctg ggc ctg tgg cgg ccg gac gtg cag gag ccg acc	144
Gly Pro Asp Gly Leu Gly Leu Trp Arg Pro Asp Val Gln Glu Pro Thr	
35 40 45	
gac gac cgc gcg gcg gag ctg ctc gcc gcg ctc tcc cgg gcc gcc gac	192
Asp Asp Arg Ala Ala Glu Leu Leu Ala Ala Leu Ser Arg Ala Ala Asp	
50 55 60	
ccg gac ctg gcg ctg cgc cag ctc cac cgc atc gtc gag gcg gag cgc	240
Pro Asp Leu Ala Leu Arg Gln Leu His Arg Ile Val Glu Ala Glu Arg	
65 70 75 80	
cgg gcc gcc ggt ccg gcg gcc acc ggt tcg gcg ctg gtg gag gcg ctc	288
Arg Ala Ala Gly Pro Ala Ala Thr Gly Ser Ala Leu Val Glu Ala Leu	
85 90 95	
gcg gac gac ccg ggg ctg cgc cgc cgg ctg atc gcc gtc ctc ggc gcc	336
Ala Asp Asp Pro Gly Leu Arg Arg Arg Leu Ile Ala Val Leu Gly Ala	
100 105 110	
tcc tcg gcg ctg ggc gac cac ctg gtc gcc aac ccc gac cag tgg ccg	384
Ser Ser Ala Leu Gly Asp His Leu Val Ala Asn Pro Asp Gln Trp Pro	
115 120 125	
gcc ctg cgg acc gcc ccg gac ggg ctc gcg ccg acc gcg gag ggc cgg	432
Ala Leu Arg Thr Ala Pro Asp Gly Leu Ala Pro Thr Ala Glu Gly Arg	
130 135 140	
ctc gac ctg tcc ggc gac ggg cag ccg gtc gcg gtg ctg cgc aag gcg	480
Leu Asp Leu Ser Gly Asp Gly Gln Pro Val Ala Val Leu Arg Lys Ala	
145 150 155 160	
tac cgg ctg gcg ctg ctg cgg atc gcg gcg gcc gac ctg acc ggc gac	528
Tyr Arg Leu Ala Leu Leu Arg Ile Ala Ala Ala Asp Leu Thr Gly Asp	
165 170 175	
cgg ggc ctg gag cag acg atg gcc gcg ctc tcc gcg ttg gcc gac gcg	576

Arg Gly Leu Glu Gln Thr Met Ala Ala Leu Ser Ala Leu Ala Asp Ala	
180 185 190	
acc ctg gcg gcg gcg tac gag atc gcc gtc ggc gag ctg ccg gag ggc	624
Thr Leu Ala Ala Ala Tyr Glu Ile Ala Val Gly Glu Leu Pro Glu Gly	
195 200 205	
acg ccc cgg ccc cgg ctc gcc gtc gtg gcg atg ggc aag tgc ggc ggt	672
Thr Pro Arg Pro Arg Leu Ala Val Val Ala Met Gly Lys Cys Gly Gly	
210 215 220	
gac gag ctg aac tac gtc tcc gac gtc gac gtg atc ttc gtg gcc gcc	720
Asp Glu Leu Asn Tyr Val Ser Asp Val Asp Val Ile Phe Val Ala Ala	
225 230 235 240	
gag gac gac gac ctc gcc gcg gcc acc acg gtc gcc acc cgg ctg atc	768
Glu Asp Asp Asp Leu Ala Ala Ala Thr Thr Val Ala Thr Arg Leu Ile	
245 250 255	
cac gtc tgc ggg ctg gtc gcc tgg ccg gtc gac gcc gcc ctg cgg ccc	816
His Val Cys Gly Leu Val Ala Trp Pro Val Asp Ala Ala Leu Arg Pro	
260 265 270	
gag ggc aat cgt ggc ccg ctg gtg cgc acc ctg gcc agc cac ctc gcc	864
Glu Gly Asn Arg Gly Pro Leu Val Arg Thr Leu Ala Ser His Leu Ala	
275 280 285	
tac tac cgg cgc tgg gcg cgg acg tgg gag ttc cag gcg ctg ctc aag	912
Tyr Tyr Arg Arg Trp Ala Arg Thr Trp Glu Phe Gln Ala Leu Leu Lys	
290 295 300	
gcc cgg ccg gcg gcc ggc gac ctg acc ctg ggc cgg gag tgg atc gac	960
Ala Arg Pro Ala Ala Gly Asp Leu Thr Leu Gly Arg Glu Trp Ile Asp	
305 310 315 320	
cag ctc gcc ccg ctc gtg tgg cgg gcc gcc gag cgc ccc gag gcg gtc	1008
Gln Leu Ala Pro Leu Val Trp Arg Ala Ala Glu Arg Pro Glu Ala Val	
325 330 335	
gag gac gtc cgc gcc atg cgg cgg aag atc atc gac aac gtc ccg ccg	1056
Glu Asp Val Arg Ala Met Arg Arg Lys Ile Ile Asp Asn Val Pro Pro	
340 345 350	
aag gag ttg gag cgc gag atc aag cgc ggc ccg ggc ggg ctg cgc gac	1104
Lys Glu Leu Glu Arg Glu Ile Lys Arg Gly Pro Gly Gly Leu Arg Asp	
355 360 365	
atc gag ttc gcc gtc cag ctg ctg caa ctg gtg cac ggc cgg ggc gac	1152
Ile Glu Phe Ala Val Gln Leu Leu Gln Leu Val His Gly Arg Gly Asp	
370 375 380	
gag tcg ctg cgg acg ccc ggc acc gtc ccg gcg ctg cgc gcg ctc gtc	1200
Glu Ser Leu Arg Thr Pro Gly Thr Val Pro Ala Leu Arg Ala Leu Val	
385 390 395 400	
gcc ggc ggc tac gtc ggc cgg gcc gac ggg gag gcg ctg ctg cgc ggc	1248

Ala Gly Gly Tyr Val Gly Arg Ala Asp Gly Glu Ala Leu Leu Arg Gly	
405 410 415	
tac cgc ttc ctg cgc ggc gtc gag cac cgc ctc cag ctc cag ggg ctg	1296
Tyr Arg Phe Leu Arg Gly Val Glu His Arg Leu Gln Leu Gln Gly Leu	
420 425 430	
cgc cgc acc cac acc gtg ccg acc gag ccg gcc gcg ctg cgc tgg ttg	1344
Arg Arg Thr His Thr Val Pro Thr Glu Pro Ala Ala Leu Arg Trp Leu	
435 440 445	
gcc gcc gcg ctg ggc tac gcg gcc acg ccg ggc cgc agc gcc gtc gag	1392
Ala Ala Ala Leu Gly Tyr Ala Ala Thr Pro Gly Arg Ser Ala Val Glu	
450 455 460	
gag ttc cgc gcc gag tgg gtc acc cac gcc acc gag gta cgc cgg ctg	1440
Glu Phe Arg Ala Glu Trp Val Thr His Ala Thr Glu Val Arg Arg Leu	
465 470 475 480	
cac gcc aag ctg ctc tac cgg ccg ctg ctg gag tcg gtg gcc cgg gtg	1488
His Ala Lys Leu Leu Tyr Arg Pro Leu Leu Glu Ser Val Ala Arg Val	
485 490 495	
ccg gcc gac ggg ctg cgg ctg acc ccg gag gcg gcc cgg cac cgg ctg	1536
Pro Ala Asp Gly Leu Arg Leu Thr Pro Glu Ala Ala Arg His Arg Leu	
500 505 510	
gag atc ctc ggc ttc gcc gac ccc gcc ggg gcg ctg cgg cac ctc cag	1584
Glu Ile Leu Gly Phe Ala Asp Pro Ala Gly Ala Leu Arg His Leu Gln	
515 520 525	
gcc ctc acc ggc ggg gtg agc cgc acg gcg gcc atc cag cgc acc ctg	1632
Ala Leu Thr Gly Gly Val Ser Arg Thr Ala Ala Ile Gln Arg Thr Leu	
530 535 540	
ctg ccg gtg ctg ctc agc gag ttc gcc gac gcc ccc gag ccg gac cgc	1680
Leu Pro Val Leu Leu Ser Glu Phe Ala Asp Ala Pro Glu Pro Asp Arg	
545 550 555 560	
ggc ctg ctc aac tac cgg cag gtc tcc gac aag ctc ggc agc acg ccc	1728
Gly Leu Leu Asn Tyr Arg Gln Val Ser Asp Lys Leu Gly Ser Thr Pro	
565 570 575	
tgg tac ctg cgc ctg ctg cgc gac tcc ggg ccg gtg gcc cgc cgg ctg	1776
Trp Tyr Leu Arg Leu Leu Arg Asp Ser Gly Pro Val Ala Arg Arg Leu	
580 585 590	
gcc cgg gtg ctc tcc tcc tcc cgc tac gcc gcc gac ctg ctg gcc cgc	1824
Ala Arg Val Leu Ser Ser Ser Arg Tyr Ala Ala Asp Leu Leu Ala Arg	
595 600 605	
gag ccg gag gcg ctg cgg atg ctg gcc gag gag agc gag ttg acc ccc	1872
Glu Pro Glu Ala Leu Arg Met Leu Ala Glu Glu Ser Glu Leu Thr Pro	
610 615 620	
cgg ccg agc ggg gtg ctc tgc gag ggc ttc gcc gcc gcc gca gcc cgg	1920

Arg Pro Ser Gly Val Leu Cys Glu Gly Phe Ala Ala Ala Ala Arg	
625 630 635 640	
cac gcc gac ccc gtc gaa gcc acc cgg gcg atc cgc gcg ctg cgc cgc	1968
His Ala Asp Pro Val Glu Ala Thr Arg Ala Ile Arg Ala Leu Arg Arg	
645 650 655	
cgg gag ctg gtc cgc atc gcc tgc gcg gac ctg ttg agc cgg gcc ggc	2016
Arg Glu Leu Val Arg Ile Ala Cys Ala Asp Leu Leu Ser Arg Ala Gly	
660 665 670	
tcg ctg gcc ccg tcg ccg ccc cgg ccc gac ggc ggg cgg gcc gcg ctc	2064
Ser Leu Ala Pro Ser Pro Pro Arg Pro Asp Gly Gly Arg Ala Ala Leu	
675 680 685	
ggt ctc gcc gac gtc gcc gcc gtg ggc acg gcg ctg gcc gac gtc acc	2112
Gly Leu Ala Asp Val Ala Ala Val Gly Thr Ala Leu Ala Asp Val Thr	
690 695 700	
gac gcc acc ctg gcc gcg gcg ctg cgg gcc gcc cgg gcc gcc cag ccg	2160
Asp Ala Thr Leu Ala Ala Ala Leu Arg Ala Ala Arg Ala Ala Gln Pro	
705 710 715 720	
ccc atg ccg ggg ctg cgc ttc gcc gtg atc ggc atg ggc cgc ctg ggc	2208
Pro Met Pro Gly Leu Arg Phe Ala Val Ile Gly Met Gly Arg Leu Gly	
725 730 735	
ggg tac gag tcg aac tac ctc tcc gac gcc gac gtg ctc ttc gtc tac	2256
Gly Tyr Glu Ser Asn Tyr Leu Ser Asp Ala Asp Val Leu Phe Val Tyr	
740 745 750	
gac ccc ccg ccc ggc gcc ggc gag agc gcg gcc ggc gcg gcg agc gcc	2304
Asp Pro Pro Pro Gly Ala Gly Glu Ser Ala Ala Gly Ala Ala Ser Ala	
755 760 765	
gcc gcc cac ggg atc gcc gag gag ttg cgt cgg ctg ctc ggc atg ccc	2352
Ala Ala His Gly Ile Ala Glu Glu Leu Arg Arg Leu Leu Gly Met Pro	
770 775 780	
gcg ccc gac ccg ccg ctg ggc gtg gac gcc gac ctg cgt ccc gag ggc	2400
Ala Pro Asp Pro Pro Leu Gly Val Asp Ala Asp Leu Arg Pro Glu Gly	
785 790 795 800	
cgg cag ggt ccg ctc gtg cgc agc ctc gcc gcg tac gcg cag tac tac	2448
Arg Gln Gly Pro Leu Val Arg Ser Leu Ala Ala Tyr Ala Gln Tyr Tyr	
805 810 815	
gcc cgc tgg tcg aag gtg tgg gag gcg cag gcg ctg ctg cgt gcc cgg	2496
Ala Arg Trp Ser Lys Val Trp Glu Ala Gln Ala Leu Leu Arg Ala Arg	
820 825 830	
ttc gtc tgc ggc gac gcc gac ctc ggc gcg gag ttc gag gcg atg gtc	2544
Phe Val Cys Gly Asp Ala Asp Leu Gly Ala Glu Phe Glu Ala Met Val	
835 840 845	
gac ccg gtc cgc tac ccg gcc gac ggg ttg acc cgc gag cag gtg gtg	2592

Asp	Pro	Val	Arg	Tyr	Pro	Ala	Asp	Gly	Leu	Thr	Arg	Glu	Gln	Val	Val		
850						855					860						
gag atc cgg cgg atc aag gcg cgg gtg gag cac gag cgg ctg ccc cgg 2640																	
Glu	Ile	Arg	Arg	Ile	Lys	Ala	Arg	Val	Glu	His	Glu	Arg	Leu	Pro	Arg		
865					870				875					880			
ggc gcc gac ccg gcc acc cac acc aag ctc ggg cgg ggc ggc ctc gcc 2688																	
Gly	Ala	Asp	Pro	Ala	Thr	His	Thr	Lys	Leu	Gly	Arg	Gly	Gly	Leu	Ala		
				885				890					895				
gac gtc gag tgg gcg gtg caa ctg ctc cag ctc cgg cac gcc ggg acg 2736																	
Asp	Val	Glu	Trp	Ala	Val	Gln	Leu	Leu	Gln	Leu	Arg	His	Ala	Gly	Thr		
			900				905					910					
gtc ccg cgg ctg cgc ggc acg cgt acg ctc gac gcc ctc gcg gcg gcc 2784																	
Val	Pro	Arg	Leu	Arg	Gly	Thr	Arg	Thr	Leu	Asp	Ala	Leu	Ala	Ala	Ala		
			915				920					925					
cgg gac gcg ggg ctg gtc gac ccg acg gac gcc acc gag atg gcg gcc 2832																	
Arg	Asp	Ala	Gly	Leu	Val	Asp	Pro	Thr	Asp	Ala	Thr	Glu	Met	Ala	Ala		
			930			935					940						
ggc tgg acc ctg gcc gcg cag gtc cgc aac gcg ctg atg ctg gtc cgc 2880																	
Gly	Trp	Thr	Leu	Ala	Ala	Gln	Val	Arg	Asn	Ala	Leu	Met	Leu	Val	Arg		
945					950				955					960			
ggc cgg gcc ggc gac cag ttg ccc cgg cac ggc gtc gag ttg gcc ggg 2928																	
Gly	Arg	Ala	Gly	Asp	Gln	Leu	Pro	Arg	His	Gly	Val	Glu	Leu	Ala	Gly		
				965					970					975			
gtg gtc cgg ctg ctc ggc cgg gac gat ccc ggc gag ttc ctc gac gag 2976																	
Val	Val	Arg	Leu	Leu	Gly	Arg	Asp	Asp	Pro	Gly	Glu	Phe	Leu	Asp	Glu		
			980				985						990				
tac ctg cgc acc ggc cgc cgc tcc cgc gcg gcg atg gag cgg gtc ctc 3024																	
Tyr	Leu	Arg	Thr	Gly	Arg	Arg	Ser	Arg	Ala	Ala	Met	Glu	Arg	Val	Leu		
			995				1000					1005					
gac gcc tga 3033																	
Asp	Ala	*															
		1010															

<210> 82
 <211> 296
 <212> PRT
 <213> Bacteria

<400> 82
 Val Ile Leu Val Ala Leu Ala Lys Ile Arg Glu Val Pro Leu Thr Gly
 1 5 10 15
 Ala Asp Ala Gly Pro Tyr Gly Val Thr Val Gly Pro Asp Gly Ala Leu
 20 25 30
 Trp Leu Thr Leu Val His Ala Gly Ala Val Ala Arg Val Gly Ala Asp
 35 40 45

Gly Asp Leu Arg Thr Trp Gln Val Ala Ala Asp Ser Arg Pro Leu Ile
 50 55 60
 Val Thr Pro Gly Pro Asp Gly Ala Leu Trp Phe Thr Arg Ser Gly Asp
 65 70 75 80
 Asp Arg Ile Gly Arg Ile Thr Thr Asp Gly Glu Gln Ser Ala Val Ala
 85 90 95
 Leu Pro Pro Gly Ser Gly Pro Cys Gly Ile Ala Ala Gly Pro Asp Gly
 100 105 110
 Ala Leu Trp Tyr Ala Ala Met Thr Ala Asp Ala Val Gly Arg Val Thr
 115 120 125
 Thr Asp Gly Lys Val Thr Gln Phe Pro Leu Pro Val Ser Gly Gly Phe
 130 135 140
 Ala Ser Met Val Ala Ala Gly Pro Asp Glu Ala Val Trp Phe Thr Leu
 145 150 155 160
 Asn Gln Ala Asn Ala Val Gly Arg Ile Gly Thr Asp Gly Ala Val Ala
 165 170 175
 Leu His Pro Leu Pro Thr Glu Gly Ala Ala Pro Val Gly Ile Thr Ala
 180 185 190
 Gly Ala Asp Gly Ala Leu Trp Phe Val Glu Ile Gly Ala Gly Gln Leu
 195 200 205
 Gly Arg Ile Thr Pro Asp Gly Arg Ile Asp Glu Tyr Pro Leu Pro Asp
 210 215 220
 Arg Ala Ala Arg Pro His Ala Ile Val Ala Asp Pro Ala Gly Gly Cys
 225 230 235 240
 Trp Phe Thr Glu Trp Gly Gly Asn Arg Ile Gly His Val Ala Pro Asp
 245 250 255
 Gly Thr Ile Val Thr His Asp Leu Pro Thr Pro Ala Ala Glu Pro His
 260 265 270
 Gly Ile Thr Val Ala Pro Asp Gly Thr Val Trp Ala Ala Leu Glu Thr
 275 280 285
 Gly Ala Leu Ala His Leu Thr Pro
 290 295

<210> 83
 <211> 705
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(705)

<400> 83
 gtg cga cac gac gga acg gcc ggg gag cac cgg cac gac agg acg gcg 48
 Val Arg His Asp Gly Thr Ala Gly Glu His Arg His Asp Arg Thr Ala
 1 5 10 15
 gcg ccg gtg gac gac cat tgg cgg cac ccg gac gtg gac gag gag acc 96
 Ala Pro Val Asp Asp His Trp Arg His Pro Asp Val Asp Glu Glu Thr
 20 25 30
 gct cgg tac tgg gag gag ctc tac ggg cgg cgc gac cgg tac tgg agc 144
 Ala Arg Tyr Trp Glu Glu Leu Tyr Gly Arg Arg Asp Arg Tyr Trp Ser
 35 40 45

ggg cgg gcg aac ccg atc ctg gtc gac gtc gcc ggg ccg ctg ccg gcc	192
Gly Arg Ala Asn Pro Ile Leu Val Asp Val Ala Gly Pro Leu Pro Ala	
50 55 60	
ggc acc gcg ctg gac ctc ggc tgc ggc gag ggc ggc gac gcg atc tgg	240
Gly Thr Ala Leu Asp Leu Gly Cys Gly Glu Gly Gly Asp Ala Ile Trp	
65 70 75 80	
ctg gcc ggg ccg ggc tgg ccg gtg acg gcg gtg gac gtc gcc gag acc	288
Leu Ala Gly Arg Gly Trp Arg Val Thr Ala Val Asp Val Ala Glu Thr	
85 90 95	
gcc ctc gac ccg gcg tcc gca gcg gcg gcc gag gcc ggg gtg gcg tcc	336
Ala Leu Asp Arg Ala Ser Ala Ala Ala Ala Glu Ala Gly Val Ala Ser	
100 105 110	
cgc atc gag ttc cgc ccg cac gac ctc acc ccg acc ttc ccg ccg ggc	384
Arg Ile Glu Phe Arg Arg His Asp Leu Thr Arg Thr Phe Pro Pro Gly	
115 120 125	
gag ttc gac ctg gtc tcc gcg cag ttc ctc cag tcg ccg ctg gag ttc	432
Glu Phe Asp Leu Val Ser Ala Gln Phe Leu Gln Ser Pro Leu Glu Phe	
130 135 140	
ccc ccg gga gag gtg ctg cgc tcg gcg gcc ccg gcc gtg gcc ccc ggc	480
Pro Arg Gly Glu Val Leu Arg Ser Ala Ala Arg Ala Val Ala Pro Gly	
145 150 155 160	
ggc ccg ctg ctc gtc gtc gag cac ggc gag gtc ccg ccg tgg gga ccg	528
Gly Arg Leu Leu Val Val Glu His Gly Glu Val Pro Pro Trp Gly Arg	
165 170 175	
cac gcg cac ccg gac gtg cgc ttc ccc acc ccg cag gag acc ctc gcc	576
His Ala His Pro Asp Val Arg Phe Pro Thr Pro Gln Glu Thr Leu Ala	
180 185 190	
gag ctg gac ctc gac ccg gac ccg tgg ctc acc gag ccg ctc gac gcc	624
Glu Leu Asp Leu Asp Pro Asp Arg Trp Leu Thr Glu Arg Leu Asp Ala	
195 200 205	
ccg cgc ccg cag gcc acc ggc ccg gac ggc cat acc ggg acc ctc gtc	672
Pro Arg Arg Gln Ala Thr Gly Pro Asp Gly His Thr Gly Thr Leu Val	
210 215 220	
gac cac gtg gtg ctg gtc cgc cgc cgc ccg tag	705
Asp His Val Val Leu Val Arg Arg Arg Pro *	
225 230	

<210> 84
 <211> 234
 <212> PRT
 <213> Bacteria

<400> 84
 Val Arg His Asp Gly Thr Ala Gly Glu His Arg His Asp Arg Thr Ala

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Ala Pro Val Asp Asp His Trp Arg His Pro Asp Val Asp Glu Glu Thr			
20	25	30	
Ala Arg Tyr Trp Glu Glu Leu Tyr Gly Arg Arg Asp Arg Tyr Trp Ser			
35	40	45	
Gly Arg Ala Asn Pro Ile Leu Val Asp Val Ala Gly Pro Leu Pro Ala			
50	55	60	
Gly Thr Ala Leu Asp Leu Gly Cys Gly Glu Gly Gly Asp Ala Ile Trp			
65	70	75	80
Leu Ala Gly Arg Gly Trp Arg Val Thr Ala Val Asp Val Ala Glu Thr			
85	90	95	
Ala Leu Asp Arg Ala Ser Ala Ala Ala Glu Ala Gly Val Ala Ser			
100	105	110	
Arg Ile Glu Phe Arg Arg His Asp Leu Thr Arg Thr Phe Pro Pro Gly			
115	120	125	
Glu Phe Asp Leu Val Ser Ala Gln Phe Leu Gln Ser Pro Leu Glu Phe			
130	135	140	
Pro Arg Gly Glu Val Leu Arg Ser Ala Ala Arg Ala Val Ala Pro Gly			
145	150	155	160
Gly Arg Leu Leu Val Val Glu His Gly Glu Val Pro Pro Trp Gly Arg			
165	170	175	
His Ala His Pro Asp Val Arg Phe Pro Thr Pro Gln Glu Thr Leu Ala			
180	185	190	
Glu Leu Asp Leu Asp Pro Asp Arg Trp Leu Thr Glu Arg Leu Asp Ala			
195	200	205	
Pro Arg Arg Gln Ala Thr Gly Pro Asp Gly His Thr Gly Thr Leu Val			
210	215	220	
Asp His Val Val Leu Val Arg Arg Arg Pro			
225	230		

<210> 85

<211> 1320

<212> DNA

<213> .

<220>

<221> CDS

<222> (1)...(1320)

<400> 85

gtg ggc atg cgg cgc agt cgg gtg gtg gcg gtg gcc gcc gcg tcc gcc	48		
Val Gly Met Arg Arg Ser Arg Val Val Ala Val Ala Ala Ser Ala			
1	5	10	15
gtg ctc ctc ggc gtg acg tat ctc gct ctt ccg ccg acc ggt tcc gac	96		
Val Leu Leu Gly Val Thr Tyr Leu Ala Leu Pro Pro Thr Gly Ser Asp			
20	25	30	
ctc gcc gcg cag gtc gcc cgg gcc gac ttc ttc gcc gcc cac ggc ctc	144		
Leu Ala Ala Gln Val Ala Arg Ala Asp Phe Phe Ala Ala His Gly Leu			
35	40	45	
gcc ccg gtc gac ctg cgc tgg tac ggc ggg gtc cag cag ttc ggc tac	192		
Ala Pro Val Asp Leu Arg Trp Tyr Gly Gly Val Gln Gln Phe Gly Tyr			
50	55	60	

agc ctg gtc tcc cag ccg gtg atg gcg ctg ctc ggg gtg cgg gtc acc	240
Ser Leu Val Ser Gln Pro Val Met Ala Leu Leu Gly Val Arg Val Thr	
65 70 75 80	
ggc gtg ctg gcg ctg gtg gcg gcg gcg acc gcg ttc gcg gcg ctg ctg	288
Gly Val Leu Ala Leu Val Ala Ala Ala Thr Ala Phe Ala Ala Leu Leu	
85 90 95	
gtg cgc acc ggg gtg ccg cgc ccg ctg ctc ggc agc ctg gtc ggg gtg	336
Val Arg Thr Gly Val Pro Arg Pro Leu Leu Gly Ser Leu Val Gly Val	
100 105 110	
gtc acg atc gcc ggc aac ctg gtc tcg ggc cgg gtg acg tac ggc ctc	384
Val Thr Ile Ala Gly Asn Leu Val Ser Gly Arg Val Thr Tyr Gly Leu	
115 120 125	
ggg gtg gcc ttc ggc ctc ggc gcg ctg ctc gcc ctc acc ctc ccc cgc	432
Gly Val Ala Phe Gly Leu Gly Ala Leu Leu Ala Leu Thr Leu Pro Arg	
130 135 140	
ggc ccg gcc gca cgg gcc gcc gac tcc gac ccg gcc gca ccg gcc gac	480
Gly Pro Ala Ala Arg Ala Ala Asp Ser Asp Pro Ala Ala Pro Ala Asp	
145 150 155 160	
tcc gac gcc gac ggg cgg gcg cgg cga cgg cag gtc gcg cgg ctc ggg	528
Ser Asp Ala Asp Gly Arg Ala Arg Arg Arg Gln Val Ala Arg Leu Gly	
165 170 175	
ctg gcg gtc gcc ggg gcg ctg ctg gcc tcg gcg gcg agc ccg gtg gcg	576
Leu Ala Val Ala Gly Ala Leu Leu Ala Ser Ala Ala Ser Pro Val Ala	
180 185 190	
ggc ctc ttc gtc ggc ctg gcc ggc gcg gcg ctg ctg ctc acc cgc cgg	624
Gly Leu Phe Val Gly Leu Ala Gly Ala Ala Leu Leu Thr Arg Arg	
195 200 205	
tac gcc gac ggc ctg gcg ctc ggc gtc gcc gcc gcg ctg ccg ctc ggg	672
Tyr Ala Asp Gly Leu Ala Leu Gly Val Ala Ala Ala Leu Pro Leu Gly	
210 215 220	
gcg acc gcg ctg ctc ttc ggc gac ggc ggc tgg atg aac atc agc cgc	720
Ala Thr Ala Leu Leu Phe Gly Asp Gly Gly Trp Met Asn Ile Ser Arg	
225 230 235 240	
acc gac acg ctg cgc gcc gtg ctg acc agc ctg ctg gtc gcc gcg ctg	768
Thr Asp Thr Leu Arg Ala Val Leu Thr Ser Leu Leu Val Ala Ala Leu	
245 250 255	
gtg gcg tac cgg ccg gtg cgg gtg ggc gcg ctg ctc tcg gcg gcc ggg	816
Val Ala Tyr Arg Pro Val Arg Val Gly Ala Leu Leu Ser Ala Ala Gly	
260 265 270	
gtg ctg gcg gcg gcg ctg gtg cac acc ccg gtc ggg ctg aac gcc acc	864
Val Leu Ala Ala Ala Leu Val His Thr Pro Val Gly Leu Asn Ala Thr	
275 280 285	

cgg ctg gcg gtc atg ttc ggc ctg ccg ctg ctg gcc gcc gcc gcc cgc 912
 Arg Leu Ala Val Met Phe Gly Leu Pro Leu Leu Ala Ala Ala Ala Arg
 290 295 300

ccc ccg gtc ggg ctg gcg cgg tgg tgg gcc cga cgc ggg cgg ggc gcg 960
 Pro Pro Val Gly Leu Ala Arg Trp Trp Ala Arg Arg Gly Arg Gly Ala
 305 310 315 320

gcg cgg ggc ggg gtg ggc ggc cgg gac gcg gcg cag ggg cgg agc aag 1008
 Ala Arg Gly Gly Val Gly Gly Arg Asp Ala Ala Gln Gly Arg Ser Lys
 325 330 335

gtc cgg ggc cgc gtg gcg ctg gcc acg ctg ctg gcg gcc ggc tgc tgg 1056
 Val Arg Gly Arg Val Ala Leu Ala Thr Leu Leu Ala Ala Gly Cys Trp
 340 345 350

tgg cag ccg ccg gtg ccc ccc gcc gac ctg cgc agc gtc gac gac ccg 1104
 Trp Gln Pro Pro Val Pro Pro Ala Asp Leu Arg Ser Val Asp Asp Pro
 355 360 365

acc ggc cgg gcc gcg tac ttg cgc cgc tgc ggg agt tcc tcg acg ggc 1152
 Thr Gly Arg Ala Ala Tyr Leu Arg Arg Cys Gly Ser Ser Ser Thr Gly
 370 375 380

agc ggc tca ccg gcc ggg tcg agg tgc cgc cga ccc gca act act ggg 1200
 Ser Gly Ser Pro Ala Gly Ser Arg Cys Arg Arg Pro Ala Thr Thr Gly
 385 390 395 400

agg cgg cgc ggc tgg gcg agg tgc cgc tgg ccc ggg gct ggc tgc ggc 1248
 Arg Arg Arg Gly Trp Ala Arg Cys Arg Trp Pro Gly Ala Gly Cys Gly
 405 410 415

agg ccg aca tcg acc gga acc ccc tct tct tca cca ccg tcc cgg gcg 1296
 Arg Pro Thr Ser Thr Gly Thr Pro Ser Ser Ser Pro Pro Ser Arg Ala
 420 425 430

cgg ccg gca ccg ggg tgc cgc tga 1320
 Arg Pro Ala Pro Gly Cys Arg *
 435

<210> 86
 <211> 439
 <212> PRT
 <213> Bacteria

<400> 86
 Val Gly Met Arg Arg Ser Arg Val Val Ala Val Ala Ala Ala Ser Ala
 1 5 10 15
 Val Leu Leu Gly Val Thr Tyr Leu Ala Leu Pro Pro Thr Gly Ser Asp
 20 25 30
 Leu Ala Ala Gln Val Ala Arg Ala Asp Phe Phe Ala Ala His Gly Leu
 35 40 45
 Ala Pro Val Asp Leu Arg Trp Tyr Gly Gly Val Gln Gln Phe Gly Tyr
 50 55 60

Ser Leu Val Ser Gln Pro Val Met Ala Leu Leu Gly Val Arg Val Thr
 65 70 75 80
 Gly Val Leu Ala Leu Val Ala Ala Ala Thr Ala Phe Ala Ala Leu Leu
 85 90 95
 Val Arg Thr Gly Val Pro Arg Pro Leu Leu Gly Ser Leu Val Gly Val
 100 105 110
 Val Thr Ile Ala Gly Asn Leu Val Ser Gly Arg Val Thr Tyr Gly Leu
 115 120 125
 Gly Val Ala Phe Gly Leu Gly Ala Leu Leu Ala Leu Thr Leu Pro Arg
 130 135 140
 Gly Pro Ala Ala Arg Ala Ala Asp Ser Asp Pro Ala Ala Pro Ala Asp
 145 150 155 160
 Ser Asp Ala Asp Gly Arg Ala Arg Arg Arg Gln Val Ala Arg Leu Gly
 165 170 175
 Leu Ala Val Ala Gly Ala Leu Leu Ala Ser Ala Ala Ser Pro Val Ala
 180 185 190
 Gly Leu Phe Val Gly Leu Ala Gly Ala Ala Leu Leu Leu Thr Arg Arg
 195 200 205
 Tyr Ala Asp Gly Leu Ala Leu Gly Val Ala Ala Ala Leu Pro Leu Gly
 210 215 220
 Ala Thr Ala Leu Leu Phe Gly Asp Gly Gly Trp Met Asn Ile Ser Arg
 225 230 235 240
 Thr Asp Thr Leu Arg Ala Val Leu Thr Ser Leu Leu Val Ala Ala Leu
 245 250 255
 Val Ala Tyr Arg Pro Val Arg Val Gly Ala Leu Leu Ser Ala Ala Gly
 260 265 270
 Val Leu Ala Ala Ala Leu Val His Thr Pro Val Gly Leu Asn Ala Thr
 275 280 285
 Arg Leu Ala Val Met Phe Gly Leu Pro Leu Leu Ala Ala Ala Ala Arg
 290 295 300
 Pro Pro Val Gly Leu Ala Arg Trp Trp Ala Arg Arg Gly Arg Gly Ala
 305 310 315 320
 Ala Arg Gly Gly Val Gly Gly Arg Asp Ala Ala Gln Gly Arg Ser Lys
 325 330 335
 Val Arg Gly Arg Val Ala Leu Ala Thr Leu Leu Ala Ala Gly Cys Trp
 340 345 350
 Trp Gln Pro Pro Val Pro Pro Ala Asp Leu Arg Ser Val Asp Asp Pro
 355 360 365
 Thr Gly Arg Ala Ala Tyr Leu Arg Arg Cys Gly Ser Ser Ser Thr Gly
 370 375 380
 Ser Gly Ser Pro Ala Gly Ser Arg Cys Arg Arg Pro Ala Thr Thr Gly
 385 390 395 400
 Arg Arg Arg Gly Trp Ala Arg Cys Arg Trp Pro Gly Ala Gly Cys Gly
 405 410 415
 Arg Pro Thr Ser Thr Gly Thr Pro Ser Ser Ser Pro Pro Ser Arg Ala
 420 425 430
 Arg Pro Ala Pro Gly Cys Arg
 435

<210> 87
 <211> 1431
 <212> DNA
 <213> Bacteria

<220>

<221> CDS

<222> (1)...(1431)

<400> 87

atg tcc ggc gtg cct cac cac ctc gcg cgc tgg atc ggc ctg gcc ggc	48
Met Ser Gly Val Pro His His Leu Ala Arg Trp Ile Gly Leu Ala Gly	
1 5 10 15	
tcg acg ctg ctc gcc gtg gcc gcg ttc ctc ggc gga gcg ctg ccc gac	96
Ser Thr Leu Leu Ala Val Ala Ala Phe Leu Gly Gly Ala Leu Pro Asp	
20 25 30	
ggc gat ttg cgc ccc acc ccg ctc agc atc tgg cag ggc ccg cac ggc	144
Gly Asp Leu Arg Pro Thr Pro Leu Ser Ile Trp Gln Gly Pro His Gly	
35 40 45	
ccg ttg atc atc gcc acc tgg gcg gtc ggc acg ggc ctg atg gcg tac	192
Pro Leu Ile Ile Ala Thr Trp Ala Val Gly Thr Gly Leu Met Ala Tyr	
50 55 60	
gcc tgg tgg gcg ctg cgc gac cgg gtg ccg tcg acc cgc tgg gcc gtg	240
Ala Trp Trp Ala Leu Arg Asp Arg Val Pro Ser Thr Arg Trp Ala Val	
65 70 75 80	
gtc acc gcc ggg ctc tgg ctg ctg ccg ctg ctg gtc gcg ccg ccg ctg	288
Val Thr Ala Gly Leu Trp Leu Leu Pro Leu Leu Val Ala Pro Pro Leu	
85 90 95	
ggc agc cga gac gtc tac gcg tac gcc tgc cag ggc gcc agc tac tcc	336
Gly Ser Arg Asp Val Tyr Ala Tyr Ala Cys Gln Gly Ala Ser Tyr Ser	
100 105 110	
gcc ggc atc aac ccg tac gag cag ggt gtc tcg gca ctg ccc tgc ccg	384
Ala Gly Ile Asn Pro Tyr Glu Gln Gly Val Ser Ala Leu Pro Cys Pro	
115 120 125	
tgg ctg gac acc atc tcc tac atc tgg cgg gac acc tcg gcc ccg tac	432
Trp Leu Asp Thr Ile Ser Tyr Ile Trp Arg Asp Thr Ser Ala Pro Tyr	
130 135 140	
ggg ccg ctg ttc ctg ctg atc gcc ggg gcg gtg gtc gag gcg acc ggg	480
Gly Pro Leu Phe Leu Leu Ile Ala Gly Ala Val Val Glu Ala Thr Gly	
145 150 155 160	
tcg ctg acc ggc agc atc gtg ctg ttc cgg ctg ctg gcg gtg gcc ggg	528
Ser Leu Thr Gly Ser Ile Val Leu Phe Arg Leu Leu Ala Val Ala Gly	
165 170 175	
gtg ggg ctg acc gcg gcc tgc ctg ccg ccg ctg gcc cgg cgc tgc ggc	576
Val Gly Leu Thr Ala Ala Cys Leu Pro Pro Leu Ala Arg Arg Cys Gly	
180 185 190	
gtg ccg gcc ggc cgg gcg gtc tgg ctg gcg ctg ggc tcg ccg ctg atc	624
Val Pro Ala Gly Arg Ala Val Trp Leu Ala Leu Gly Ser Pro Leu Ile	
195 200 205	

ggg gtg cac ctg atc tcg ggc gcg cac aac gac gcg ctg atg gtg ggg	672
Gly Val His Leu Ile Ser Gly Ala His Asn Asp Ala Leu Met Val Gly	
210 215 220	
ctg ctc gtg gcc ggg ctg gcg atg gtg gtg gcc cgg ccg ggc cgc ccc	720
Leu Leu Val Ala Gly Leu Ala Met Val Val Ala Arg Pro Gly Arg Pro	
225 230 235 240	
ggc ccg ctg ctc gcc ggg gga gcg ctg ctc ggc ctc gcc ggc gcc gtc	768
Gly Pro Leu Leu Ala Gly Gly Ala Leu Leu Gly Leu Ala Gly Ala Val	
245 250 255	
aag gtc acc gcg ctg gtg gtg gtg ccg ttc gcg gcg ctc gcc gcg atc	816
Lys Val Thr Ala Leu Val Val Val Pro Phe Ala Ala Leu Ala Ala Ile	
260 265 270	
gtc ggg gcg tac tcg atc agg gcg ttg atc cgc gac ggt ggg tgg gtg	864
Val Gly Ala Tyr Ser Ile Arg Ala Leu Ile Arg Asp Gly Gly Trp Val	
275 280 285	
gtc ggc ggg gcg ctc gcg gcg gtc gtc ggc gcg acc ctc gcc agc ggc	912
Val Gly Gly Ala Leu Ala Ala Val Val Gly Ala Thr Leu Ala Ser Gly	
290 295 300	
ctg ggc ttc ggc tgg gtc acc ggg ctg gag cag ggc ggc ctg gtg atc	960
Leu Gly Phe Gly Trp Val Thr Gly Leu Glu Gln Gly Gly Leu Val Ile	
305 310 315 320	
gcc tgg acc tcg ccc ccg acg gcg gtg ggg cag acc gtc gcc tac ctc	1008
Ala Trp Thr Ser Pro Pro Thr Ala Val Gly Gln Thr Val Ala Tyr Leu	
325 330 335	
gcc gcg ccg ttc ggc tgg cac ggc gat ccg ctg ccg gtc acc ccg ggc	1056
Ala Ala Pro Phe Gly Trp His Gly Asp Pro Leu Pro Val Thr Arg Gly	
340 345 350	
atc ggg atg gcc gtg ctc gcg ctg gtg ctg atc tgg ctg tgg tgg ccg	1104
Ile Gly Met Ala Val Leu Ala Leu Val Leu Ile Trp Leu Trp Trp Arg	
355 360 365	
gcc cgc acc ccg gag ccg ctg tgg cac gcc ggc ctg gcg ctg gcc gcc	1152
Ala Arg Thr Arg Glu Pro Leu Trp His Ala Gly Leu Ala Leu Ala Ala	
370 375 380	
acg gtc gcg ctc gcc ccg ctg ttc cac ccc tgg tac tgg acc tgg ccg	1200
Thr Val Ala Leu Ala Pro Leu Phe His Pro Trp Tyr Trp Thr Trp Pro	
385 390 395 400	
ctg gcc gtg ctc gcg gcc acg tcg ccg cgc acc ggc tgg ttc gcg ctc	1248
Leu Ala Val Leu Ala Ala Thr Ser Arg Arg Thr Gly Trp Phe Ala Leu	
405 410 415	
gtc gcg gtg ctc tcg gcg ttc ctg gtc ctc gcg gac ggc acc ggg ctg	1296
Val Ala Val Leu Ser Ala Phe Leu Val Leu Ala Asp Gly Thr Gly Leu	
420 425 430	

gcc cgg tac agc aag acg gtc ggc gcc ccg ctg atg acg ctg ttg gtg 1344
 Ala Arg Tyr Ser Lys Thr Val Gly Ala Pro Leu Met Thr Leu Leu Val
 435 440 445

atg gtg gtg gcc gtc cgc ttg gta cgg tcg gct tgg gcg gcc cgc cgg 1392
 Met Val Val Ala Val Arg Leu Val Arg Ser Ala Trp Ala Ala Arg Arg
 450 455 460

tcg gct cgg gcg gcc cgc cgg ccg gcc gcc gtg aac tga 1431
 Ser Ala Arg Ala Ala Arg Arg Pro Ala Ala Val Asn *
 465 470 475

<210> 88
 <211> 476
 <212> PRT
 <213> Bacteria

<400> 88
 Met Ser Gly Val Pro His His Leu Ala Arg Trp Ile Gly Leu Ala Gly
 1 5 10 15
 Ser Thr Leu Leu Ala Val Ala Ala Phe Leu Gly Gly Ala Leu Pro Asp
 20 25 30
 Gly Asp Leu Arg Pro Thr Pro Leu Ser Ile Trp Gln Gly Pro His Gly
 35 40 45
 Pro Leu Ile Ile Ala Thr Trp Ala Val Gly Thr Gly Leu Met Ala Tyr
 50 55 60
 Ala Trp Trp Ala Leu Arg Asp Arg Val Pro Ser Thr Arg Trp Ala Val
 65 70 75 80
 Val Thr Ala Gly Leu Trp Leu Leu Pro Leu Leu Val Ala Pro Pro Leu
 85 90 95
 Gly Ser Arg Asp Val Tyr Ala Tyr Ala Cys Gln Gly Ala Ser Tyr Ser
 100 105 110
 Ala Gly Ile Asn Pro Tyr Glu Gln Gly Val Ser Ala Leu Pro Cys Pro
 115 120 125
 Trp Leu Asp Thr Ile Ser Tyr Ile Trp Arg Asp Thr Ser Ala Pro Tyr
 130 135 140
 Gly Pro Leu Phe Leu Leu Ile Ala Gly Ala Val Val Glu Ala Thr Gly
 145 150 155 160
 Ser Leu Thr Gly Ser Ile Val Leu Phe Arg Leu Leu Ala Val Ala Gly
 165 170 175
 Val Gly Leu Thr Ala Ala Cys Leu Pro Pro Leu Ala Arg Arg Cys Gly
 180 185 190
 Val Pro Ala Gly Arg Ala Val Trp Leu Ala Leu Gly Ser Pro Leu Ile
 195 200 205
 Gly Val His Leu Ile Ser Gly Ala His Asn Asp Ala Leu Met Val Gly
 210 215 220
 Leu Leu Val Ala Gly Leu Ala Met Val Val Ala Arg Pro Gly Arg Pro
 225 230 235 240
 Gly Pro Leu Leu Ala Gly Gly Ala Leu Leu Gly Leu Ala Gly Ala Val
 245 250 255
 Lys Val Thr Ala Leu Val Val Val Pro Phe Ala Ala Leu Ala Ala Ile
 260 265 270
 Val Gly Ala Tyr Ser Ile Arg Ala Leu Ile Arg Asp Gly Gly Trp Val
 275 280 285
 Val Gly Gly Ala Leu Ala Ala Val Val Gly Ala Thr Leu Ala Ser Gly

290		295		300
Leu Gly Phe Gly Trp Val Thr Gly Leu Glu Gln Gly Gly Leu Val Ile				
305		310		315
Ala Trp Thr Ser Pro Pro Thr Ala Val Gly Gln Thr Val Ala Tyr Leu				
	325		330	335
Ala Ala Pro Phe Gly Trp His Gly Asp Pro Leu Pro Val Thr Arg Gly				
	340		345	350
Ile Gly Met Ala Val Leu Ala Leu Val Leu Ile Trp Leu Trp Trp Arg				
	355		360	365
Ala Arg Thr Arg Glu Pro Leu Trp His Ala Gly Leu Ala Leu Ala Ala				
	370		375	380
Thr Val Ala Leu Ala Pro Leu Phe His Pro Trp Tyr Trp Thr Trp Pro				
385		390		395
Leu Ala Val Leu Ala Ala Thr Ser Arg Arg Thr Gly Trp Phe Ala Leu				
	405		410	415
Val Ala Val Leu Ser Ala Phe Leu Val Leu Ala Asp Gly Thr Gly Leu				
	420		425	430
Ala Arg Tyr Ser Lys Thr Val Gly Ala Pro Leu Met Thr Leu Leu Val				
	435		440	445
Met Val Val Ala Val Arg Leu Val Arg Ser Ala Trp Ala Ala Arg Arg				
	450		455	460
Ser Ala Arg Ala Ala Arg Arg Pro Ala Ala Val Asn				
465		470		475

<210> 89
 <211> 1509
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(1509)

<400> 89	
gtg acc aca ccc ggc tcc ccg tcg acc tcg ccc gac gtc tcg ccg tcg	48
Val Thr Thr Pro Gly Ser Pro Ser Thr Ser Pro Asp Val Ser Pro Ser	
1 5 10 15	
ccg gat gcc gcc cgg ctc gcc cgg tac gcg ggc ctg ggc ggg gcg gtg	96
Pro Asp Ala Ala Arg Leu Ala Arg Tyr Ala Gly Leu Gly Gly Ala Val	
20 25 30	
ctg ttg gcc gtc gcc ggc tgg cgg ggc ggg gcg ctg ccg tcg acc ccg	144
Leu Leu Ala Val Ala Gly Trp Arg Gly Gly Ala Leu Pro Ser Thr Pro	
35 40 45	
ctg gac gtc ccc ccg ggg gac cgt tgg ctg tcg gac ggt ggg ccg ctg	192
Leu Asp Val Pro Pro Gly Asp Arg Trp Leu Ser Asp Gly Gly Pro Leu	
50 55 60	
acg ctg ggg gtc tgg ctg gtc ggc acg gcc ctg ctg gtc ggc gcc tgg	240
Thr Leu Gly Val Trp Leu Val Gly Thr Ala Leu Leu Val Gly Ala Trp	
65 70 75 80	
tgg gcg ctg cgc cgg ggc gcg ccg tcc acg cgg tgg gcg tac ctg acc	288

Trp	Ala	Leu	Arg	Arg	Gly	Ala	Pro	Ser	Thr	Arg	Trp	Ala	Tyr	Leu	Thr		
				85					90					95			
gcc	ggg	ctg	tgg	gcg	ctg	ccg	ctg	ctg	gtc	acc	ccg	ccg	ctg	ggc	agc	336	
Ala	Gly	Leu	Trp	Ala	Leu	Pro	Leu	Leu	Val	Thr	Pro	Pro	Leu	Gly	Ser		
			100					105					110				
cgg	gac	gtc	tac	tcc	tac	gcc	tgc	cag	ggc	tgg	gcg	tac	gcg	cac	ggc	384	
Arg	Asp	Val	Tyr	Ser	Tyr	Ala	Cys	Gln	Gly	Trp	Ala	Tyr	Ala	His	Gly		
		115					120					125					
gtc	gac	ccg	tac	gcg	acc	ggg	gtg	gcc	gag	gcc	ggc	tgc	ccc	tgg	gtg	432	
Val	Asp	Pro	Tyr	Ala	Thr	Gly	Val	Ala	Glu	Ala	Gly	Cys	Pro	Trp	Val		
		130				135					140						
gag	tcg	gtc	gcg	ccg	atc	tgg	cgg	gac	acg	ccc	gcc	ccg	tac	ggg	ccg	480	
Glu	Ser	Val	Ala	Pro	Ile	Trp	Arg	Asp	Thr	Pro	Ala	Pro	Tyr	Gly	Pro		
145					150					155					160		
ttc	ttc	gtg	ctg	ctc	gcc	gcg	ctc	gcg	gtg	acc	ctc	ggc	ggc	ggc	ctg	528	
Phe	Phe	Val	Leu	Leu	Ala	Ala	Leu	Ala	Val	Thr	Leu	Gly	Gly	Gly	Leu		
				165					170					175			
gtg	ggc	gct	gtc	gtg	gcg	ttc	cgc	ctg	ctc	gcg	gtc	gcc	ggg	gtg	ttg	576	
Val	Gly	Ala	Val	Val	Ala	Phe	Arg	Leu	Leu	Ala	Val	Ala	Gly	Val	Leu		
			180					185					190				
ctg	gcc	gcc	ctc	tgc	ctg	gtg	ggc	ctg	gcc	cgc	gcc	gcg	ggc	gtg	ccc	624	
Leu	Ala	Ala	Leu	Cys	Leu	Val	Gly	Leu	Ala	Arg	Ala	Ala	Gly	Val	Pro		
		195					200					205					
acc	cgc	agg	gcg	gcc	tgg	ctg	gcg	ctg	gcc	tgc	ccg	ctg	gtc	ggg	gtc	672	
Thr	Arg	Arg	Ala	Ala	Trp	Leu	Ala	Leu	Ala	Cys	Pro	Leu	Val	Gly	Val		
		210				215					220						
cac	ctg	gtg	gcc	ggc	gcg	cac	aac	gac	gcg	gtg	atg	ctc	ggc	ctg	ctg	720	
His	Leu	Val	Ala	Gly	Ala	His	Asn	Asp	Ala	Val	Met	Leu	Gly	Leu	Leu		
225					230					235					240		
ctg	ctg	ggc	ctg	ctg	gtg	ctg	gtg	cgc	ggg	ccc	ggc	aag	ccg	aag	ccg	768	
Leu	Leu	Gly	Leu	Leu	Val	Leu	Val	Arg	Gly	Pro	Gly	Lys	Pro	Lys	Pro		
				245					250					255			
ctg	ttg	gtg	gcc	ggg	gcc	ctg	ctc	ggg	ctg	gcg	gtg	acg	gtg	aag	gcc	816	
Leu	Leu	Val	Ala	Gly	Ala	Leu	Leu	Gly	Leu	Ala	Val	Thr	Val	Lys	Ala		
			260					265					270				
acc	gcc	gtg	gtg	gtg	ctt	ccc	ttc	gcg	gcg	ctg	gcc	gcg	gtg	ctg	ggc	864	
Thr	Ala	Val	Val	Val	Leu	Pro	Phe	Ala	Ala	Leu	Ala	Ala	Val	Leu	Gly		
			275				280					285					
cgc	tac	acc	gtg	cgg	gcg	ctg	ctg	cgc	gac	gcc	ggc	tgg	ctg	gcc	ggc	912	
Arg	Tyr	Thr	Val	Arg	Ala	Leu	Leu	Arg	Asp	Ala	Gly	Trp	Leu	Ala	Gly		
	290					295					300						
ggg	acg	ctc	ggc	gcg	gtg	ggg	gtc	acc	tcg	ctg	ctg	tcc	ggc	ctc	gga	960	

Gly Thr Leu Gly Ala Val Gly Val Thr Ser Leu Leu Ser Gly Leu Gly	
305 310 315 320	
ctc ggc tgg ata cgc ggg ctg acc cgc agc ggg gac tcc gag cag tgg	1008
Leu Gly Trp Ile Arg Gly Leu Thr Arg Ser Gly Asp Ser Glu Gln Trp	
325 330 335	
acg tcg ccc ccg acg gcg gtg ggc ttc gtc gtc gac tac gcg ggc gag	1056
Thr Ser Pro Pro Thr Ala Val Gly Phe Val Val Asp Tyr Ala Gly Glu	
340 345 350	
ctc gcc ggg cgg gac ccg ggc gcg gtg ccg gcg acc cgc gcg gcg gcg	1104
Leu Ala Gly Arg Asp Pro Gly Ala Val Pro Ala Thr Arg Ala Ala Ala	
355 360 365	
ctg ctg ctg ctc gcc gtg ctc gtg gcg gcg ctg tgg tgg cgg gcc tgg	1152
Leu Leu Leu Leu Ala Val Leu Val Ala Ala Leu Trp Trp Arg Ala Trp	
370 375 380	
tcg ggg ctg cgc cgg ctg aac gac gtc cgg cag cgg gtg gcc cgc ctg	1200
Ser Gly Leu Arg Arg Leu Asn Asp Val Arg Gln Arg Val Ala Arg Leu	
385 390 395 400	
gac gcc gcc cgc ccc cgg gtg acc ctg ctc ggc gcg ggg ctg gcg ctg	1248
Asp Ala Ala Arg Pro Arg Val Thr Leu Leu Gly Ala Gly Leu Ala Leu	
405 410 415	
gcc gcc acg gtc ctc ctc gcc ccg gtc ttc cac ccc tgg tac gcc acc	1296
Ala Ala Thr Val Leu Leu Ala Pro Val Phe His Pro Trp Tyr Ala Thr	
420 425 430	
tgg ccg ctg gcc ctg ctc gcg gtc gcc gcg acg cgg acc acc tgg ttc	1344
Trp Pro Leu Ala Leu Leu Ala Val Ala Ala Thr Arg Thr Thr Trp Phe	
435 440 445	
gtg gcg ccc tgc gcg gcg gcg gcc ttc ctc acc ctg ccc gac ggc acc	1392
Val Ala Pro Cys Ala Ala Ala Ala Phe Leu Thr Leu Pro Asp Gly Thr	
450 455 460	
aac ctg gcc cgg ttc acc aag gcc ccg ggc gcg atc gcg atg acc gcg	1440
Asn Leu Ala Arg Phe Thr Lys Ala Pro Gly Ala Ile Ala Met Thr Ala	
465 470 475 480	
ctg gtg gcc ggg ctg gcg gtg tgg ggc ctg ctc cgg ctg cgc cgg acc	1488
Leu Val Ala Gly Leu Ala Val Trp Gly Leu Leu Arg Leu Arg Arg Thr	
485 490 495	
cgt gcc gcg cgc ccc ggc tga	1509
Arg Ala Ala Arg Pro Gly *	
500	

<210> 90
 <211> 502
 <212> PRT
 <213> Bacteria

<400> 90

Val	Thr	Thr	Pro	Gly	Ser	Pro	Ser	Thr	Ser	Pro	Asp	Val	Ser	Pro	Ser
1				5					10					15	
Pro	Asp	Ala	Ala	Arg	Leu	Ala	Arg	Tyr	Ala	Gly	Leu	Gly	Gly	Ala	Val
			20					25					30		
Leu	Leu	Ala	Val	Ala	Gly	Trp	Arg	Gly	Gly	Ala	Leu	Pro	Ser	Thr	Pro
		35					40					45			
Leu	Asp	Val	Pro	Pro	Gly	Asp	Arg	Trp	Leu	Ser	Asp	Gly	Gly	Pro	Leu
	50					55					60				
Thr	Leu	Gly	Val	Trp	Leu	Val	Gly	Thr	Ala	Leu	Leu	Val	Gly	Ala	Trp
65					70					75					80
Trp	Ala	Leu	Arg	Arg	Gly	Ala	Pro	Ser	Thr	Arg	Trp	Ala	Tyr	Leu	Thr
				85					90					95	
Ala	Gly	Leu	Trp	Ala	Leu	Pro	Leu	Leu	Val	Thr	Pro	Pro	Leu	Gly	Ser
			100					105					110		
Arg	Asp	Val	Tyr	Ser	Tyr	Ala	Cys	Gln	Gly	Trp	Ala	Tyr	Ala	His	Gly
		115					120					125			
Val	Asp	Pro	Tyr	Ala	Thr	Gly	Val	Ala	Glu	Ala	Gly	Cys	Pro	Trp	Val
	130					135					140				
Glu	Ser	Val	Ala	Pro	Ile	Trp	Arg	Asp	Thr	Pro	Ala	Pro	Tyr	Gly	Pro
145					150					155					160
Phe	Phe	Val	Leu	Leu	Ala	Ala	Leu	Ala	Val	Thr	Leu	Gly	Gly	Gly	Leu
				165					170					175	
Val	Gly	Ala	Val	Val	Ala	Phe	Arg	Leu	Leu	Ala	Val	Ala	Gly	Val	Leu
			180					185					190		
Leu	Ala	Ala	Leu	Cys	Leu	Val	Gly	Leu	Ala	Arg	Ala	Ala	Gly	Val	Pro
		195					200					205			
Thr	Arg	Arg	Ala	Ala	Trp	Leu	Ala	Leu	Ala	Cys	Pro	Leu	Val	Gly	Val
	210					215					220				
His	Leu	Val	Ala	Gly	Ala	His	Asn	Asp	Ala	Val	Met	Leu	Gly	Leu	Leu
225					230					235					240
Leu	Leu	Gly	Leu	Leu	Val	Leu	Val	Arg	Gly	Pro	Gly	Lys	Pro	Lys	Pro
			245						250					255	
Leu	Leu	Val	Ala	Gly	Ala	Leu	Leu	Gly	Leu	Ala	Val	Thr	Val	Lys	Ala
		260						265					270		
Thr	Ala	Val	Val	Val	Leu	Pro	Phe	Ala	Ala	Leu	Ala	Ala	Val	Leu	Gly
		275					280						285		
Arg	Tyr	Thr	Val	Arg	Ala	Leu	Leu	Arg	Asp	Ala	Gly	Trp	Leu	Ala	Gly
	290					295					300				
Gly	Thr	Leu	Gly	Ala	Val	Gly	Val	Thr	Ser	Leu	Leu	Ser	Gly	Leu	Gly
305					310					315					320
Leu	Gly	Trp	Ile	Arg	Gly	Leu	Thr	Arg	Ser	Gly	Asp	Ser	Glu	Gln	Trp
			325						330					335	
Thr	Ser	Pro	Pro	Thr	Ala	Val	Gly	Phe	Val	Val	Asp	Tyr	Ala	Gly	Glu
			340					345					350		
Leu	Ala	Gly	Arg	Asp	Pro	Gly	Ala	Val	Pro	Ala	Thr	Arg	Ala	Ala	Ala
		355					360					365			
Leu	Leu	Leu	Leu	Ala	Val	Leu	Val	Ala	Ala	Leu	Trp	Trp	Arg	Ala	Trp
	370					375					380				
Ser	Gly	Leu	Arg	Arg	Leu	Asn	Asp	Val	Arg	Gln	Arg	Val	Ala	Arg	Leu
385					390					395					400
Asp	Ala	Ala	Arg	Pro	Arg	Val	Thr	Leu	Leu	Gly	Ala	Gly	Leu	Ala	Leu
				405						410				415	
Ala	Ala	Thr	Val	Leu	Leu	Ala	Pro	Val	Phe	His	Pro	Trp	Tyr	Ala	Thr
			420					425					430		
Trp	Pro	Leu	Ala	Leu	Leu	Ala	Val	Ala	Ala	Thr	Arg	Thr	Thr	Trp	Phe

435 440 445
 Val Ala Pro Cys Ala Ala Ala Phe Leu Thr Leu Pro Asp Gly Thr
 450 455 460
 Asn Leu Ala Arg Phe Thr Lys Ala Pro Gly Ala Ile Ala Met Thr Ala
 465 470 475 480
 Leu Val Ala Gly Leu Ala Val Trp Gly Leu Leu Arg Leu Arg Arg Thr
 485 490 495
 Arg Ala Ala Arg Pro Gly
 500

<210> 91
 <211> 750
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(750)

<400> 91
 atg agc aca gcc gag gaa tcg ttg ccg ggc aac gcc acc acc ggc gtg 48
 Met Ser Thr Ala Glu Glu Ser Leu Pro Gly Asn Ala Thr Thr Gly Val
 1 5 10 15

 gtg cgc gtc ggc gac acc gtg cgc cgt ccg gtc ggc ccc tgg agc gac 96
 Val Arg Val Gly Asp Thr Val Arg Arg Pro Val Gly Pro Trp Ser Asp
 20 25 30

 gtg gtg gac gcc ctg ctg gaa cac ctg cac gcg gtg gga ttc gcc ggt 144
 Val Val Asp Ala Leu Leu Glu His Leu His Ala Val Gly Phe Ala Gly
 35 40 45

 gcc ccc cgg cct ctg ggt cgc gac gcg cag ggc cgg cag gtg ctg gag 192
 Ala Pro Arg Pro Leu Gly Arg Asp Ala Gln Gly Arg Gln Val Leu Glu
 50 55 60

 tac gtc cca ggc gag gtc ggc gag gcg tcg ggc acg tac ccg gtg gcg 240
 Tyr Val Pro Gly Glu Val Gly Glu Ala Ser Gly Thr Tyr Pro Val Ala
 65 70 75 80

 gac ctg ttc gcg atc ggc cgg atg ctg gcc gag ctg cac gag gcg ctg 288
 Asp Leu Phe Ala Ile Gly Arg Met Leu Ala Glu Leu His Glu Ala Leu
 85 90 95

 gcc ggg ttc acc ccg ccg gcc ggc gcg gcg tgg cag cgg ctc atc ccg 336
 Ala Gly Phe Thr Pro Pro Ala Gly Ala Ala Trp Gln Arg Leu Ile Pro
 100 105 110

 ccg gac cgg gag gaa ctc gtc tgc cac aac gac gtg gcc ccg tgg aac 384
 Pro Asp Arg Glu Glu Leu Val Cys His Asn Asp Val Ala Pro Trp Asn
 115 120 125

 ctg atc agg gcg gac cgg ggc tgg gtg ctg atc gac tgg gac tgc gcg 432
 Leu Ile Arg Ala Asp Arg Gly Trp Val Leu Ile Asp Trp Asp Cys Ala
 130 135 140

gcg ccg ggc tcc cgg ctc tgg gac ctc gcg tac gcc gcg cag agc atg 480
 Ala Pro Gly Ser Arg Leu Trp Asp Leu Ala Tyr Ala Ala Gln Ser Met
 145 150 155 160

 gcc ggc ctg cgc ccg gac cgg ccg gtg gcc gag tcg gcg gcc cgg ctg 528
 Ala Gly Leu Arg Pro Asp Arg Pro Val Ala Glu Ser Ala Ala Arg Leu
 165 170 175

 cgc gcc ttc gcc gac ggc tac cgg ctg gac gag gcg tcc cgc ccg gcc 576
 Arg Ala Phe Ala Asp Gly Tyr Arg Leu Asp Glu Ala Ser Arg Pro Ala
 180 185 190

 ctg gcc gcc atg ctg ggt cgc cgc gcc cgg gcc atg tac gac ctg ttg 624
 Leu Ala Ala Met Leu Gly Arg Arg Ala Arg Ala Met Tyr Asp Leu Leu
 195 200 205

 cgc gag ggc gcg gaa cag cgg cgc gag ccg tgg gcc cgg atc tgg acc 672
 Arg Glu Gly Ala Glu Gln Arg Arg Glu Pro Trp Ala Arg Ile Trp Thr
 210 215 220

 gag gac ggc ccg tac tgg ctg gcc acc gcc gaa cac ctc gac gcc cac 720
 Glu Asp Gly Pro Tyr Trp Leu Ala Thr Ala Glu His Leu Asp Ala His
 225 230 235 240

 acc gag gca tgg gag atc gcc ctg cgc tga 750
 Thr Glu Ala Trp Glu Ile Ala Leu Arg *
 245

<210> 92
 <211> 249
 <212> PRT
 <213> Bacteria

<400> 92
 Met Ser Thr Ala Glu Glu Ser Leu Pro Gly Asn Ala Thr Thr Gly Val
 1 5 10 15
 Val Arg Val Gly Asp Thr Val Arg Arg Pro Val Gly Pro Trp Ser Asp
 20 25 30
 Val Val Asp Ala Leu Leu Glu His Leu His Ala Val Gly Phe Ala Gly
 35 40 45
 Ala Pro Arg Pro Leu Gly Arg Asp Ala Gln Gly Arg Gln Val Leu Glu
 50 55 60
 Tyr Val Pro Gly Glu Val Gly Glu Ala Ser Gly Thr Tyr Pro Val Ala
 65 70 75 80
 Asp Leu Phe Ala Ile Gly Arg Met Leu Ala Glu Leu His Glu Ala Leu
 85 90 95
 Ala Gly Phe Thr Pro Pro Ala Gly Ala Ala Trp Gln Arg Leu Ile Pro
 100 105 110
 Pro Asp Arg Glu Glu Leu Val Cys His Asn Asp Val Ala Pro Trp Asn
 115 120 125
 Leu Ile Arg Ala Asp Arg Gly Trp Val Leu Ile Asp Trp Asp Cys Ala
 130 135 140
 Ala Pro Gly Ser Arg Leu Trp Asp Leu Ala Tyr Ala Ala Gln Ser Met
 145 150 155 160

Ala	Gly	Leu	Arg	Pro	Asp	Arg	Pro	Val	Ala	Glu	Ser	Ala	Ala	Arg	Leu
				165					170					175	
Arg	Ala	Phe	Ala	Asp	Gly	Tyr	Arg	Leu	Asp	Glu	Ala	Ser	Arg	Pro	Ala
			180					185					190		
Leu	Ala	Ala	Met	Leu	Gly	Arg	Arg	Ala	Arg	Ala	Met	Tyr	Asp	Leu	Leu
			195				200						205		
Arg	Glu	Gly	Ala	Glu	Gln	Arg	Arg	Glu	Pro	Trp	Ala	Arg	Ile	Trp	Thr
			210				215					220			
Glu	Asp	Gly	Pro	Tyr	Trp	Leu	Ala	Thr	Ala	Glu	His	Leu	Asp	Ala	His
			225			230				235				240	
Thr	Glu	Ala	Trp	Glu	Ile	Ala	Leu	Arg							
					245										

<210> 93
 <211> 1315
 <212> DNA
 <213> Bacteria

<400> 93
 catcctccct cgcctaaagg cgggggagtc cgaccctcgc ggggtgggggt tcctggttca 60
 ccgcagaccg cacggaagga ggtccttcgt gtctgacgtc cgctccgcag gcgtttttcg 120
 tctcggccag cccggccgcg acggtgatgt tcttggtcgc gttgacgtcc cggtcacgcc 180
 ggggtgccga actcggacac gtccagtggc gtgtgccgag ggagagtgtg gcgagcaggt 240
 gcccgcacgc cgagcaggtc ttcgacgacg ggtaccagcg gtccaccacc gcgagggtgc 300
 ggccgtcgcg gtgcgccttg taggtgagca ggggtgcggaa ctccggcccag ccggtacgcg 360
 agatcgcttt ggccagggag tggttgcgga ccatgttcgc cacggccagg tcctccacgg 420
 cgatggcggc gaaccggcgc accagggcgg tggactgctg gtggaggaag tcccggcggg 480
 cgtcgcgcac ctgcgaatgc gctcgggcga ccatcgttt ggctttggcg cggttggcgg 540
 agcccttctg tcggcggggc attatccgct gataccgctt gagtcggcgt tcccgccgtt 600
 ccatgtgctt cgggtggggg atgcgttcgc cgggtggacag caccgcgaag tcggtcaggc 660
 cgaggtccac gccaccgcgc tcgccggtgg gtccgggtgc ggccgggtgtg tcgacgtcga 720
 cggcgaaggt cacgaaccag cggccgtccg ggtcacgcga caccgtcacc atcgtcggat 780
 ccaaccccgc cggatccacg ttcggcaacg accacacgaa ccgcagcacc ccgggtgtct 840
 ttcccaacga caggttcccc ctgcggaggc ggaacgccga ccgggtgtaa ctggcggact 900
 ggcggccgtg tcgggacttg tagcgcgggt accgggcccg cttggcgaag aaggcgggtca 960
 tggcggtgtg ctggtgccgc agggctctgt gcaacggcac cgacgacacc tcaccagat 1020
 acgccaggtc gggctgcttc ttcattctccg tcaacgcccg atcggctctc gcgtaggagg 1080
 tggatctccg ttcggtgtgc cagcgggcgt gacgggcggc gacggtgcgg ttccagacga 1140
 cacgtacaca cccgaacgtg cggttcagca ccgccgcctg ctccggggtc gggtagcccc 1200
 gacacctgta cgccgtccgc acaggaccag ccctaccaga aaggacagtc gtggctgaca 1260
 acgcatccgc cgttcgtccc cgccctgaag gacgtggcat cctggcgggtg atccg 1315

<210> 94
 <211> 1263
 <212> DNA
 <213> Bacteria

<220>
 <221> CDS
 <222> (1)...(1263)

<400> 94
 gtg cta gat atg act caa gta gac ggg tcg ccc ctg cca act ctg gaa 48
 Val Leu Asp Met Thr Gln Val Asp Gly Ser Pro Leu Pro Thr Leu Glu
 1 5 10 15

agg caa gtg atc acc gtg cgt gtg ctg ttc gcc agt ctc gga acc cat	96
Arg Gln Val Ile Thr Val Arg Val Leu Phe Ala Ser Leu Gly Thr His	
20 25 30	
ggc cac acc tac ccc ctg ctg cca ctg gcc acg gcc gcc cgt gcg gcg	144
Gly His Thr Tyr Pro Leu Leu Pro Leu Ala Thr Ala Ala Arg Ala Ala	
35 40 45	
ggc cac gag gtc acc ttc gcc acc ggc gag ggc ttc gcg gcc acc ctg	192
Gly His Glu Val Thr Phe Ala Thr Gly Glu Gly Phe Ala Gly Thr Leu	
50 55 60	
cgg aag ctg ggc ttc gag ccg gtc gcg acc ggg atg ccg gtc ttc gac	240
Arg Lys Leu Gly Phe Glu Pro Val Ala Thr Gly Met Pro Val Phe Asp	
65 70 75 80	
ggg ttc ctg gcg gcg ctg cgg atc cgc ttc gac acc gac agc ccc gag	288
Gly Phe Leu Ala Ala Leu Arg Ile Arg Phe Asp Thr Asp Ser Pro Glu	
85 90 95	
ggg ctg acc ccc gag cag ctc agt gag ctg ccg cag atc gtg ttc ggg	336
Gly Leu Thr Pro Glu Gln Leu Ser Glu Leu Pro Gln Ile Val Phe Gly	
100 105 110	
cgg gtc atc ccg cag cgc gtc ttc gac gag ctc cag ccg gtg atc gaa	384
Arg Val Ile Pro Gln Arg Val Phe Asp Glu Leu Gln Pro Val Ile Glu	
115 120 125	
cgg ttg cga ccc gac ctc gtg gtg cag gag atc agc aac tac ggc gcc	432
Arg Leu Arg Pro Asp Leu Val Val Gln Glu Ile Ser Asn Tyr Gly Ala	
130 135 140	
ggc ctg gcc gcc ctg aag gcg ggc atc ccg acc atc tgc cac ggg gtc	480
Gly Leu Ala Ala Leu Lys Ala Gly Ile Pro Thr Ile Cys His Gly Val	
145 150 155 160	
ggc cgg gac acg ccg gac gac ctg acc cgg tcc atc gag gag gag gtg	528
Gly Arg Asp Thr Pro Asp Asp Leu Thr Arg Ser Ile Glu Glu Glu Val	
165 170 175	
cgg ggg ctg gcc cag cgg ctc ggc ctc gac ctg ccg ccc ggg cgc atc	576
Arg Gly Leu Ala Gln Arg Leu Gly Leu Asp Leu Pro Pro Gly Arg Ile	
180 185 190	
gac ggc ttc ggc aac ccc ttc atc gac atc ttc ccg ccg tgc ctg cag	624
Asp Gly Phe Gly Asn Pro Phe Ile Asp Ile Phe Pro Pro Ser Leu Gln	
195 200 205	
gag ccg gag ttc cgg gcc cgc ccg cgg cgc cac gag ctg cgc ccg gtg	672
Glu Pro Glu Phe Arg Ala Arg Pro Arg Arg His Glu Leu Arg Pro Val	
210 215 220	
ccc ttc gcc gag cag ggt gac ctc ccg gcc tgg ctg tcc tgc cgc gac	720
Pro Phe Ala Glu Gln Gly Asp Leu Pro Ala Trp Leu Ser Ser Arg Asp	
225 230 235 240	

acg gcc cgc ccg ctg gtc tac ctg acg ctc ggc acg tcc agc ggc ggc	768
Thr Ala Arg Pro Leu Val Tyr Leu Thr Leu Gly Thr Ser Ser Gly Gly	
245 250 255	
acc gtc gag gtg ctg cgg gcg gcg atc gac ggg ctc gcc ggc ctc gac	816
Thr Val Glu Val Leu Arg Ala Ala Ile Asp Gly Leu Ala Gly Leu Asp	
260 265 270	
gcc gac gtc ctg gtc gcc agc ggc ccg tcc ctc gac gtc agc gga ctg	864
Ala Asp Val Leu Val Ala Ser Gly Pro Ser Leu Asp Val Ser Gly Leu	
275 280 285	
ggc gag gtg ccg gca aac gta cgg ctc gag tcc tgg gtg ccg cag gcg	912
Gly Glu Val Pro Ala Asn Val Arg Leu Glu Ser Trp Val Pro Gln Ala	
290 295 300	
gcc ctg ctg ccc cac gtc gac ctg gtg gtg cac cac ggg ggc agc ggc	960
Ala Leu Leu Pro His Val Asp Leu Val Val His His Gly Gly Ser Gly	
305 310 315 320	
act acg ctc ggc gca ctg ggc gcc ggc gtg ccg cag ctg tcc ttc ccg	1008
Thr Thr Leu Gly Ala Leu Gly Ala Gly Val Pro Gln Leu Ser Phe Pro	
325 330 335	
tgg gcg ggg gac tcc ttc gcc aac gcg cag gcg gtg gcg cag gcc ggc	1056
Trp Ala Gly Asp Ser Phe Ala Asn Ala Gln Ala Val Ala Gln Ala Gly	
340 345 350	
gcc ggt gac cac ctg ctg ccc gac aac atc agc ccc gac tcc gtg tcc	1104
Ala Gly Asp His Leu Leu Pro Asp Asn Ile Ser Pro Asp Ser Val Ser	
355 360 365	
ggc gcc gcg aag cgc ctg ttg gcc gag gag agc tac cgg gcc ggg gcg	1152
Gly Ala Ala Lys Arg Leu Leu Ala Glu Glu Ser Tyr Arg Ala Gly Ala	
370 375 380	
cgg gcc gtg gcg gcc gag atc gcg gcc atg ccg ggc ccc gac gag gtc	1200
Arg Ala Val Ala Ala Glu Ile Ala Ala Met Pro Gly Pro Asp Glu Val	
385 390 395 400	
gtc cgc ctg ctg ccg ggc ttc gcc tcc agg agc gcg ggc tga ccg gcg	1248
Val Arg Leu Leu Pro Gly Phe Ala Ser Arg Ser Ala Gly * Pro Ala	
405 410 415	
cta cgt ctg ccg tag	1263
Leu Arg Leu Pro *	

<210> 95

<211> 419

<212> PRT

<213> Bacteria

<400> 95

Val	Leu	Asp	Met	Thr	Gln	Val	Asp	Gly	Ser	Pro	Leu	Pro	Thr	Leu	Glu	1	5	10	15
Arg	Gln	Val	Ile	Thr	Val	Arg	Val	Leu	Phe	Ala	Ser	Leu	Gly	Thr	His	20	25	30	
Gly	His	Thr	Tyr	Pro	Leu	Leu	Pro	Leu	Ala	Thr	Ala	Ala	Arg	Ala	Ala	35	40	45	
Gly	His	Glu	Val	Thr	Phe	Ala	Thr	Gly	Glu	Gly	Phe	Ala	Gly	Thr	Leu	50	55	60	
Arg	Lys	Leu	Gly	Phe	Glu	Pro	Val	Ala	Thr	Gly	Met	Pro	Val	Phe	Asp	65	70	75	80
Gly	Phe	Leu	Ala	Ala	Leu	Arg	Ile	Arg	Phe	Asp	Thr	Asp	Ser	Pro	Glu	85	90	95	
Gly	Leu	Thr	Pro	Glu	Gln	Leu	Ser	Glu	Leu	Pro	Gln	Ile	Val	Phe	Gly	100	105	110	
Arg	Val	Ile	Pro	Gln	Arg	Val	Phe	Asp	Glu	Leu	Gln	Pro	Val	Ile	Glu	115	120	125	
Arg	Leu	Arg	Pro	Asp	Leu	Val	Val	Gln	Glu	Ile	Ser	Asn	Tyr	Gly	Ala	130	135	140	
Gly	Leu	Ala	Ala	Leu	Lys	Ala	Gly	Ile	Pro	Thr	Ile	Cys	His	Gly	Val	145	150	155	160
Gly	Arg	Asp	Thr	Pro	Asp	Asp	Leu	Thr	Arg	Ser	Ile	Glu	Glu	Glu	Val	165	170	175	
Arg	Gly	Leu	Ala	Gln	Arg	Leu	Gly	Leu	Asp	Leu	Pro	Pro	Gly	Arg	Ile	180	185	190	
Asp	Gly	Phe	Gly	Asn	Pro	Phe	Ile	Asp	Ile	Phe	Pro	Pro	Ser	Leu	Gln	195	200	205	
Glu	Pro	Glu	Phe	Arg	Ala	Arg	Pro	Arg	Arg	His	Glu	Leu	Arg	Pro	Val	210	215	220	
Pro	Phe	Ala	Glu	Gln	Gly	Asp	Leu	Pro	Ala	Trp	Leu	Ser	Ser	Arg	Asp	225	230	235	240
Thr	Ala	Arg	Pro	Leu	Val	Tyr	Leu	Thr	Leu	Gly	Thr	Ser	Ser	Gly	Gly	245	250	255	
Thr	Val	Glu	Val	Leu	Arg	Ala	Ala	Ile	Asp	Gly	Leu	Ala	Gly	Leu	Asp	260	265	270	
Ala	Asp	Val	Leu	Val	Ala	Ser	Gly	Pro	Ser	Leu	Asp	Val	Ser	Gly	Leu	275	280	285	
Gly	Glu	Val	Pro	Ala	Asn	Val	Arg	Leu	Glu	Ser	Trp	Val	Pro	Gln	Ala	290	295	300	
Ala	Leu	Leu	Pro	His	Val	Asp	Leu	Val	Val	His	His	Gly	Gly	Ser	Gly	305	310	315	320
Thr	Thr	Leu	Gly	Ala	Leu	Gly	Ala	Gly	Val	Pro	Gln	Leu	Ser	Phe	Pro	325	330	335	
Trp	Ala	Gly	Asp	Ser	Phe	Ala	Asn	Ala	Gln	Ala	Val	Ala	Gln	Ala	Gly	340	345	350	
Ala	Gly	Asp	His	Leu	Leu	Pro	Asp	Asn	Ile	Ser	Pro	Asp	Ser	Val	Ser	355	360	365	
Gly	Ala	Ala	Lys	Arg	Leu	Leu	Ala	Glu	Glu	Ser	Tyr	Arg	Ala	Gly	Ala	370	375	380	
Arg	Ala	Val	Ala	Ala	Glu	Ile	Ala	Ala	Met	Pro	Gly	Pro	Asp	Glu	Val	385	390	395	400
Val	Arg	Leu	Leu	Pro	Gly	Phe	Ala	Ser	Arg	Ser	Ala	Gly	Pro	Ala	Leu	405	410	415	
Arg	Leu	Pro																	